

Draft Environmental Assessment State Route 303L (Interstate 10 to US 60)

Maricopa County, Arizona

NH-303-A(AFY)

303 MA 003 H5621 01L



**Arizona Department of Transportation
Intermodal Transportation Division
Environmental Planning Group
1611 West Jackson Street, Mail Drop EM02
Phoenix, Arizona 85007**

September 2008

Version 1.6

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This draft environmental assessment has been prepared in accordance with provisions and requirements of Title 23 Code of Federal Regulations Part 771, relating to the implementation of the National Environmental Policy Act of 1969.

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Mitigation Measures

The following list describes measures that would be implemented as part of the proposed project to avoid, minimize, or otherwise mitigate environmental impacts associated with the project. The following mitigation measures and commitments are not subject to change without prior written approval from the Federal Highway Administration.

Arizona Department of Transportation Design Responsibilities

1. The Arizona Department of Transportation would coordinate with irrigation districts in the Study Area to address potential impacts on irrigation water conveyance infrastructure during the final design phase (refer to page 77).
2. Groundwater well impacts and acquisitions are handled by the Arizona Department of Transportation's Right-of-Way Group. If a well were affected by construction, well abandonment and compensation (drilling a new well) would be required. If a well were to be acquired, the water source would be replaced (refer to page 77).
3. During final design, the Arizona Department of Transportation would coordinate with the Flood Control District of Maricopa County Floodplain Manager. The proposed project would be designed to minimize floodplain encroachments and not impair flood-carrying capacity. The project would be designed such that construction would not constitute a hazardous or incompatible use, would not result in greater than a 1-foot rise in base flood elevations, and would not affect natural or beneficial floodplain values (refer to page 81).
4. The project would be subject to Section 402 of the Clean Water Act. The Arizona Department of Transportation Roadside Development Section would determine who would prepare the Stormwater Pollution Prevention Plan Index Sheet (refer to page 84).
5. Prior to construction, surveys for the Western burrowing owl would be conducted in accordance with the Arizona Game and Fish Department's *Burrowing Owl Project Clearance Guidance for Landowners* (2008) (refer to page 89).
6. Protected native plants within the construction limits would be affected by the project; therefore, the Arizona Department of Transportation would notify the Arizona Department of Agriculture at least 60 days prior to the start of construction so that the Arizona Department of Agriculture could determine the disposition of these plants (refer to page 89).
7. All disturbed soils that would not be landscaped or otherwise permanently stabilized by construction would be seeded using species native to the project vicinity. To prevent the introduction of invasive species seeds, all construction equipment would be washed at the

contractor's storage facility prior to entering the construction site. To prevent invasive species seeds from leaving the site, the contractor would inspect all construction equipment and remove all attached plant/vegetation debris prior to leaving the construction site (refer to page 89).

8. Landscaping treatment would be developed in coordination with the Arizona Department of Transportation Roadside Development Section and would incorporate native or low-water-use plants as identified by the Arizona Department of Water Resources. Landscaping would be consistent with conservation-oriented water uses in the Phoenix Active Management Area (refer to page 95).
9. To reduce lighting spillover into residential areas, shielded or cut-off lighting fixtures would be used along the freeway main line. The height of the masts would be minimized, within constraints of existing highway design standards and safety considerations (refer to page 95).
10. To minimize emissions from idling and slow-moving traffic in the construction zone, traffic control would be implemented in accordance with Part VI and the Arizona Supplement to Part VI of the *Manual on Uniform Traffic Control Devices for Streets and Highways*, 2003 edition, published by the Federal Highway Administration, including any revisions or additions and/or associated provisions in the project plans, as determined by the Arizona Department of Transportation's Traffic Design Section during final design. Disruption to traffic would be limited, especially during peak travel periods (refer to page 108).
11. Additional noise analyses would be conducted during the final design phase to determine the exact number, location, and height of noise barriers required to mitigate noise impacts in accordance with the Arizona Department of Transportation's *Noise Abatement Policy* (dated 2005) (refer to page 123).
12. During final design, the Arizona Department of Transportation project manager would contact the Arizona Department of Transportation Environmental Planning Group's hazardous materials coordinator at (602) 712-7767 to determine the need for additional site assessment. The project corridor would need to be reevaluated prior to right-of-way acquisition. A new initial site assessment, prepared in conformance with the most current version of the American Society for Testing and Materials standards (E-1527 series of standards), would be prepared (refer to page 128).
13. Any adverse impacts on sites eligible for or listed in the National Register of Historic Places as a result of the proposed project would require mitigation prior to project construction. Ideally, any sites located within the footprint of disturbance would be avoided. If avoidance were not possible, any negative impacts on the sites would be mitigated (refer to page 138 and the signed Programmatic Agreement in Appendix D).

14. During the final design phase, the Arizona Department of Transportation would communicate and coordinate with emergency services providers to minimize the potential for slower response times associated with construction (refer to page 153).
15. During the final design phase, the Arizona Department of Transportation would communicate and coordinate with Valley Metro to minimize the potential for bus service disruptions as a result of construction (refer to page 153).
16. A right-of-way acquisition program would be implemented by the Arizona Department of Transportation Right-of-Way Group in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), the Uniform Relocation Act Amendments of 1987 (Public Law 100-17), and Title VI of the Civil Rights Act of 1964. Private property owners would be compensated at fair market value for land to be acquired for project right-of-way (refer to page 159).
17. Measures to minimize construction impacts would be incorporated into construction contract specifications. Traffic would be managed by detailed traffic control plans and by procedures and guidelines specified in Part VI and the Arizona Supplement to Part VI of the *Manual on Uniform Traffic Control Devices for Streets and Highways*, 2003 edition. Construction activities that substantially disrupt traffic would not be performed during peak travel periods. Requirements for the use of construction notices and bulletins would be identified as needed. Local agencies would be consulted regarding traffic restrictions in their respective jurisdictions to minimize disruptions to local traffic. The effectiveness of the traffic control measures would be monitored during construction, and any necessary adjustments would be made (refer to page 159).
18. The Arizona Department of Transportation Utility and Railroad Engineering Section would coordinate utility involvement (refer to page 177).
19. During final design, Burlington Northern Santa Fe Railroad would be afforded the opportunity to comment on design plans (refer to page 177).

Arizona Department of Transportation Phoenix Construction District Responsibilities

1. The Arizona Department of Transportation Phoenix Construction District Office would submit the Arizona Pollutant Discharge Elimination System Notice of Intent and Notice of Termination to the Arizona Department of Environmental Quality (refer to page 84).
2. District personnel, in association with the contractor, would complete the National Emissions Standard for Hazardous Air Pollutants documentation and submit it to the appropriate Arizona Department of Transportation office, as determined by the hazardous materials coordinator, for

review 5 working days prior to being submitted to the regulatory agencies (See Arizona Department of Transportation policy SAF-6.01, February 23, 2004) (refer to page 128).

Contractor Responsibilities

1. The contractor would submit the Arizona Pollutant Discharge Elimination System Notice of Intent and Notice of Termination to the Arizona Department of Environmental Quality (refer to page 84).
2. All disturbed soils that would not be landscaped or otherwise permanently stabilized by construction would be seeded using species native to the project vicinity. To prevent the introduction of invasive species seeds, all construction equipment would be washed at the contractor's storage facility prior to entering the construction site. To prevent invasive species seeds from leaving the construction site, the contractor would inspect all construction equipment and remove all attached plant/vegetation debris prior to allowing that equipment to leave the construction site (refer to page 89).
3. In accordance with Maricopa County Rule 310, "Fugitive Dust Sources," an earthmoving permit would be obtained and a fugitive dust control plan would be prepared and submitted to Maricopa County for each construction site (refer to page 108).
4. To minimize emissions from idling and slow-moving traffic in the construction zone, traffic control would be implemented in accordance with Part VI and the Arizona Supplement to Part VI of the *Manual on Uniform Traffic Control Devices for Streets and Highways*, 2003 edition, published by the Federal Highway Administration, including any revisions or additions and/or associated provisions in the project plans, as determined by the Arizona Department of Transportation's Traffic Design Section during final design. Disruption to traffic would be limited, especially during peak travel periods (refer to page 108).
5. The contractor, in association with the Arizona Department of Transportation Engineer, would file a National Emissions Standard for Hazardous Air Pollutants notification with the Arizona Department of Environmental Quality and/or any other appropriate delegated agency as noted on the National Emissions Standard for Hazardous Air Pollutants form for the project's county or as determined by the hazardous materials coordinator, at least 10 working days prior to the modification, demolition, or removal of regulated amounts of asbestos containing material associated with structures in the project area (refer to page 128).
6. If previously unidentified cultural resources were to be encountered during activity related to the construction of the project, the contractor would stop work immediately at that location and take all reasonable steps to secure the preservation of those resources. The Resident Engineer would contact the Arizona Department of Transportation's Historic Preservation Team at

(602) 712-7767 immediately and make arrangements for the proper treatment of those resources (refer to page 138).

7. The Arizona Department of Transportation and the contractor would keep bicycle and pedestrian facilities open during construction (refer to page 153).
8. Access to businesses and residences near the project would be maintained during construction (refer to page 159).
9. Traffic would be managed by detailed traffic control plans and by procedures and guidelines specified in Part VI and the Arizona Supplement to Part VI of the *Manual on Uniform Traffic Control Devices for Streets and Highways*, 2003 edition. Construction activities that substantially disrupt traffic would not be performed during peak travel periods. Requirements for the use of construction notices and bulletins would be identified as needed. Local agencies would be consulted regarding traffic restrictions in their respective jurisdictions to minimize disruptions to local traffic. The effectiveness of the traffic control measures would be monitored during construction, and any necessary adjustments would be made (refer to page 159).

List of Acronyms and Abbreviations

ADEQ	Arizona Department of Environmental Quality
ADES	Arizona Department of Economic Security
ADMP	area drainage master plan
ADOT	Arizona Department of Transportation
ADT	average daily traffic
ADWR	Arizona Department of Water Resources
AFB	air force base
AGFD	Arizona Game and Fish Department
AMA	active management area
APE	area of potential effects
APP	Aquifer Protection Permit
ASLD	Arizona State Land Department
ASM	Arizona State Museum
ASTM	American Society for Testing and Materials
AZ	Arizona
AZPDES	Arizona Pollutant Discharge Elimination System
BE	biological evaluation
BNSF	Burlington Northern Santa Fe Railroad
BRT	bus rapid transit
CAA	Clean Air Act
CEQ	Council on Environmental Quality
C.F.R.	Code of Federal Regulations
CO	carbon monoxide
CWA	Clean Water Act
dBA	A-weighted decibel
DCR	design concept report
EA	environmental assessment
EIS	environmental impact statement
EPA	United States Environmental Protection Agency
°F	degrees Fahrenheit

List of Acronyms and Abbreviations (*continued*)

FCDMC	Flood Control District of Maricopa County
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FONSI	finding of no significant impact
FPPA	Farmland Protection Policy Act
HOV	high-occupancy vehicle
I-10	Interstate 10
I-15	Interstate 15
I-17	Interstate 17
I-40	Interstate 40
IAC	Interagency Committee on Outdoor Recreation
ISA	initial site assessment
kV	kilovolt
L_{Aeq1h}	equivalent sound level for 1 hour
L_{eq}	equivalent sound level
LOS	level of service
LRTP	<i>Long-Range Transportation Plan</i> (MAG)
Luke AFB	Luke Air Force Base
LWCF	Land and Water Conservation Fund
LWCFA	Land and Water Conservation Fund Act
MAG	Maricopa Association of Governments
MC 85	Maricopa County Route 85
MCAQD	Maricopa County Air Quality Department
MCDOT	Maricopa County Department of Transportation
mg/L	milligrams per liter
MP	milepost
mph	miles per hour
MSAT	mobile source air toxic
NAAQS	National Ambient Air Quality Standards
NAC	noise abatement criteria

List of Acronyms and Abbreviations (*continued*)

NEPA	National Environmental Policy Act
NESHAP	National Emissions Standard for Hazardous Air Pollutants
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
No.	number
NO₂	nitrogen dioxide
NOI	Notice of Intent
NOT	Notice of Termination
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWP	nationwide permit
O₃	ozone
OAQPS	Office of Air Quality Planning and Standards
PA	programmatic agreement
PAD	planned area development
PM_{2.5}	fine particulate matter
PM₁₀	particulate matter
ppm	parts per million
RFS	Regional Freeway System
RID	Roosevelt Irrigation District
RTP	<i>Regional Transportation Plan</i> (MAG)
R/W	right-of-way
SFHA	special flood hazard area
SHPO	State Historic Preservation Office/Officer
SIP	State Implementation Plan
SO₂	sulfur dioxide
SPUI	single-point urban interchange
SR	State Route
SR 101L	State Route 101 Loop
SR 202L	State Route 202 Loop

List of Acronyms and Abbreviations (*continued*)

SR 303L	State Route 303 Loop
SWPPP	Stormwater Pollution Prevention Plan
TDM	transportation demand management
TNM	Traffic Noise Model
TSM	transportation system management
µg/m³	micrograms per cubic meter
U.S.	United States
US 60	United States Route 60
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
VMT	vehicle miles traveled
vpd	vehicles per day
Waters	waters of the United States

Part 1. Introduction

A. Explanation of an Environmental Assessment

The National Environmental Policy Act of 1969 (NEPA) requires all federal agencies to assess potential impacts on the natural and man-made environments that may result from any federally funded project or program. An environmental assessment (EA) is an evaluation of natural and man-made conditions that exist within an area and could be affected by a federally funded project.

This Draft EA pertains to proposed improvements to State Route 303 Loop (SR 303L), in Maricopa County, Arizona. This document has been prepared in compliance with NEPA, other environmental laws, and the policies of the Federal Highway Administration (FHWA), which is the lead federal agency. As the agency with statewide jurisdiction, the Arizona Department of Transportation (ADOT) has prepared this document, with FHWA furnishing guidance and final approval.

This document has been prepared in accordance with provisions and requirements of Title 23 of the Code of Federal Regulations (C.F.R.) Parts 771 and 774, relating to the implementation of NEPA.

The EA process provides opportunities for input from local, state, and federal agencies and tribes on the proposed improvements. Public involvement is another integral part of the EA process, with input gathered through public scoping meetings, public information meetings, and public hearings (see Part 5, *Public Involvement and Project Coordination*, on page 192).

This Draft EA will help guide the decision-making process for the proposed improvements to SR 303L by assisting FHWA and ADOT in examining and considering the improvements' potential social, economic, and environmental impacts. An EA is conducted to decide whether to prepare a finding of no significant impact (FONSI) or to undertake the preparation of an environmental impact statement (EIS).

A study, known as a Section 4(f) evaluation, for the proposed improvements is also included in this document in Part 4, *Affected Environment and Environmental Consequences*, on page 163.

Required by the Department of Transportation Act of 1966, as amended, the Section 4(f) evaluation documents whether the proposed improvements would use land from a significant publicly owned park, recreation area, wildlife or waterfowl refuge, or significant historic site.

Part 7, *Glossary*, on page 207, contains definitions for terms used throughout this Draft EA.

B. Project Location

SR 303L is on the west side of the Phoenix metropolitan area, approximately 20 miles west of downtown Phoenix (Figure 1-1, on page 3). The Study Area for the proposed improvements generally extends 0.5 mile on each side of the existing SR 303L.

The Study Area begins at Van Buren Street, south of Interstate 10 (I-10), and extends north of US 60 to approximately milepost (MP) 21.0. The overall length of the Study Area is approximately 18 miles. Figure 1-2, on page 4, shows the Study Area and the mileposts along the existing SR 303L alignment.

C. Existing Conditions

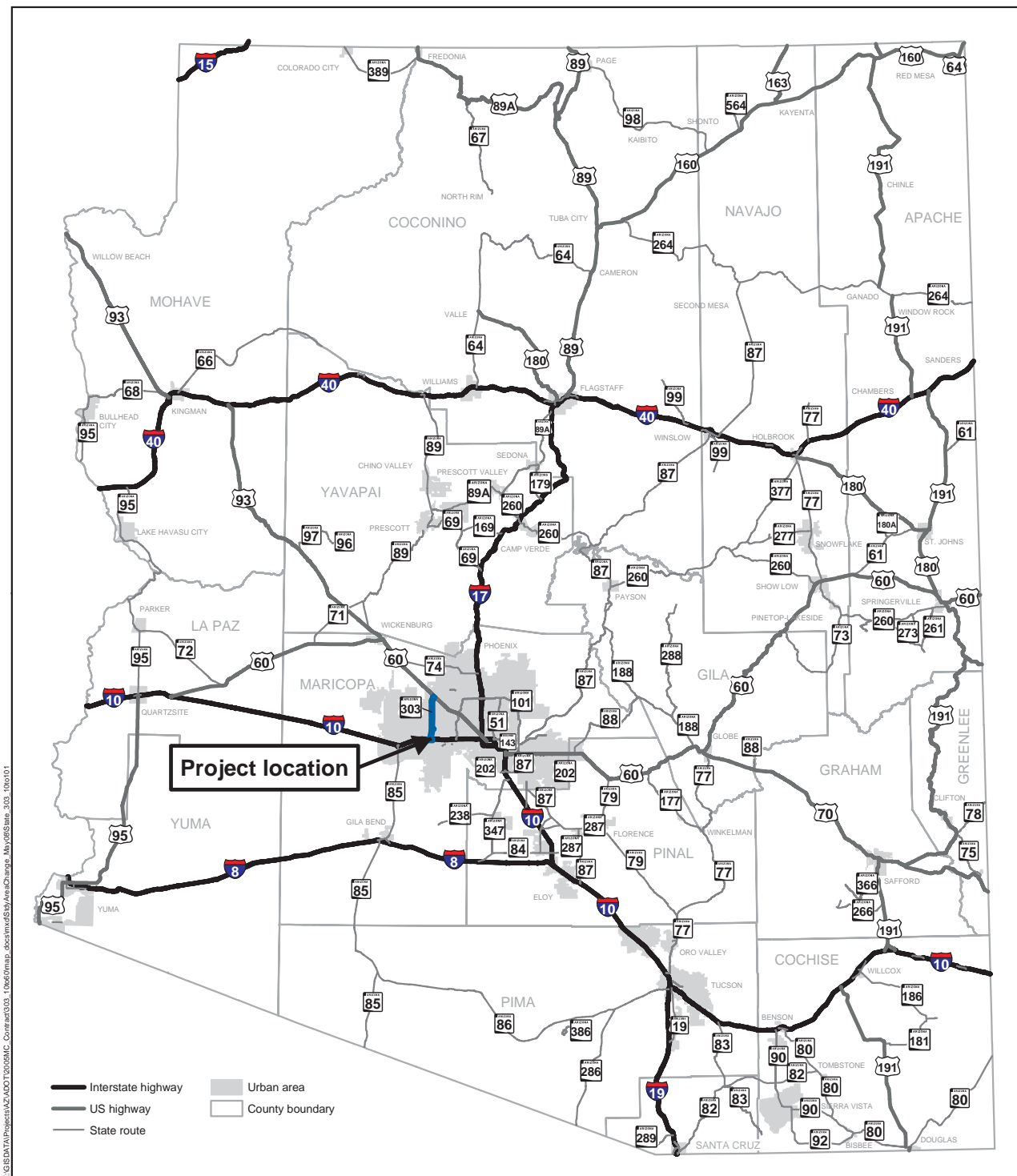
The Study Area traverses unincorporated areas of Maricopa County and the municipalities of Goodyear, Glendale, and Surprise. The Study Area is generally rural and agricultural, transitioning to suburban land uses at the southern and northern ends of the corridor. At the southern end, between I-10 and Indian School Road (MP 6.0), the area is being converted to master-planned communities like Pebble Creek and Canyon Trails Ranch within Goodyear. At the northern end of the corridor, between Cactus Road (MP 13.0) and US 60, land use is transitioning to large-scale communities like Sun City Grand, Sun City West, Bell West Ranch, Northwest Ranch, Surprise Farms, and Sierra Montana.

The central portion of the Study Area, between Indian School and Cactus roads, is predominantly agricultural or rural subdivisions of 1-acre-plus lots. Luke Air Force Base (AFB), covering approximately 1,700 acres, is just east of the Study Area and is generally bounded by Bethany Home Road (MP 8.0) on the south, Northern Avenue on the north (MP 10.0), Sarival Avenue on the west, and Litchfield Road on the east. The base both influences and restricts surrounding land uses.

Within the Study Area, SR 303L consists of a rural, two- to four-lane highway with at-grade arterial street crossings at every mile, with the exception of the intersections at Clearview Boulevard (MP 17.7) and Mountain View Boulevard (MP 18.1), each of which has grade separations but without on- and off-ramps.

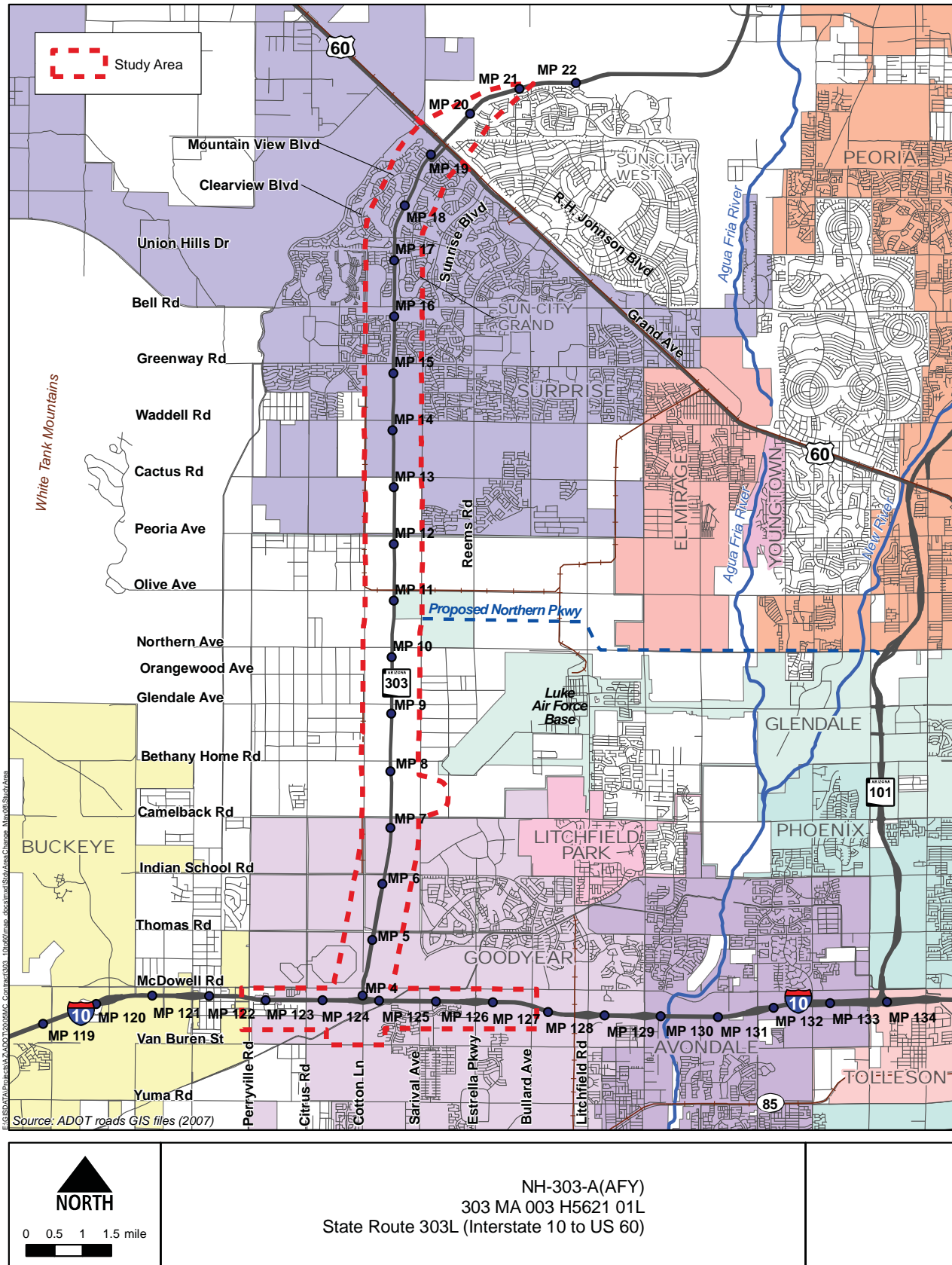
From I-10 to just south of Indian School Road, SR 303L is a four-lane divided roadway. From just south of Indian School Road to Clearview Boulevard, the roadway consists of one 12-foot-wide travel lane in each direction, with turning lanes at Northern Avenue, Olive Avenue (MP 11.0), Waddell Road (MP 14.2), Greenway Road (MP 15.2), and Bell Road (MP 16.2). From Clearview Boulevard north to US 60, SR 303L is a four-lane divided roadway.

Figure 1-1. Location of project in state



<p>NORTH</p> <p>0 5 10 20 30 miles</p>	<p>NH-303-A(AFY) 303 MA 003 H5621 01L State Route 303L (Interstate 10 to US 60)</p>
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Figure 1-2. Study Area



D. Project Background and Overview

In the *West Area Transportation Analysis* (1984), the Maricopa Association of Governments (MAG) first identified the long-term need for a highway that would extend from Maricopa County Route 85 (MC 85) to Interstate 17 (I-17).

The general corridor for this highway was referred to as the Cotton Lane/Northwest Loop. It was included in the MAG *Long-Range Transportation Plan* (LRTP) in 1985, and added to the State Highway System as State Route (SR) 517. The corridor was renamed the Estrella Corridor in 1986. The proposed freeway was expected to be constructed in the 20-year period after 1985, when voters approved Proposition 300—the implementation of a half-cent sales tax over the next 20 years to fund transportation improvements throughout the county. In 1987, the State Transportation Board renamed the Estrella Corridor as SR 303L.

In 1987, the *Estrella Freeway Draft Reconnaissance Report* was completed by ADOT as a component of a route location study and preliminary design. No substantive environmental issues were raised by the study. At the time, the area was sparsely populated, relatively slow growth was projected, minimal natural habitat or vegetation was present, and limited evidence of cultural resources sites had been discovered.

In 1991, ADOT completed location studies and a state-level EA for the entire SR 303L corridor, from MC 85 to I-17 (ADOT 1991). The EA included a substantial public involvement component, including public information meetings, newsletters, press releases, and two public hearings (attended by over 300 citizens). Again, no substantive environmental issues were identified.

Because of funding considerations, SR 303L was removed from the LRTP in 1994. A few years later, the Maricopa County Department of Transportation (MCDOT) initiated a series of studies to revive the project development process, including a design concept report (DCR) for the stretch of highway proposed from Indian School Road to Clearview Boulevard and an EA for the stretch from I-10 to US 60.

In 2000, an EA update (*State Route 303L Interim Roadway Project*) was conducted by MCDOT to provide baseline environmental conditions and address environmental effects associated with increased SR 303L capacity needs relative to the development of Sun City Grand. Sun City Grand is a master-planned community for up to 10,000 residents between the Union Hills section line (MP 17.0) and US 60, straddling the SR 303L corridor. As a result of this study, MCDOT agreed to assist in the funding and construction of overpasses at Clearview Boulevard and Mountain View

Boulevard, to shift the alignment slightly west away from existing homes, and to partially depress the roadway profile between Clearview and Mountain View boulevards. These mitigation measures substantially reduced the potential for noise impacts on surrounding residential areas. The project resulting from this EA update was constructed and opened to traffic in September 2002. The bridge over US 60 was constructed and opened to traffic in May 2004.

In 2006, ADOT and MCDOT developed an intergovernmental agreement to transfer to ADOT the responsibility for construction, operation, and maintenance of SR 303L as a fully access-controlled freeway facility.

Figure 1-3, on page 7, recounts the major decisions and events leading to the current SR 303L configuration and to its proposed improvements.

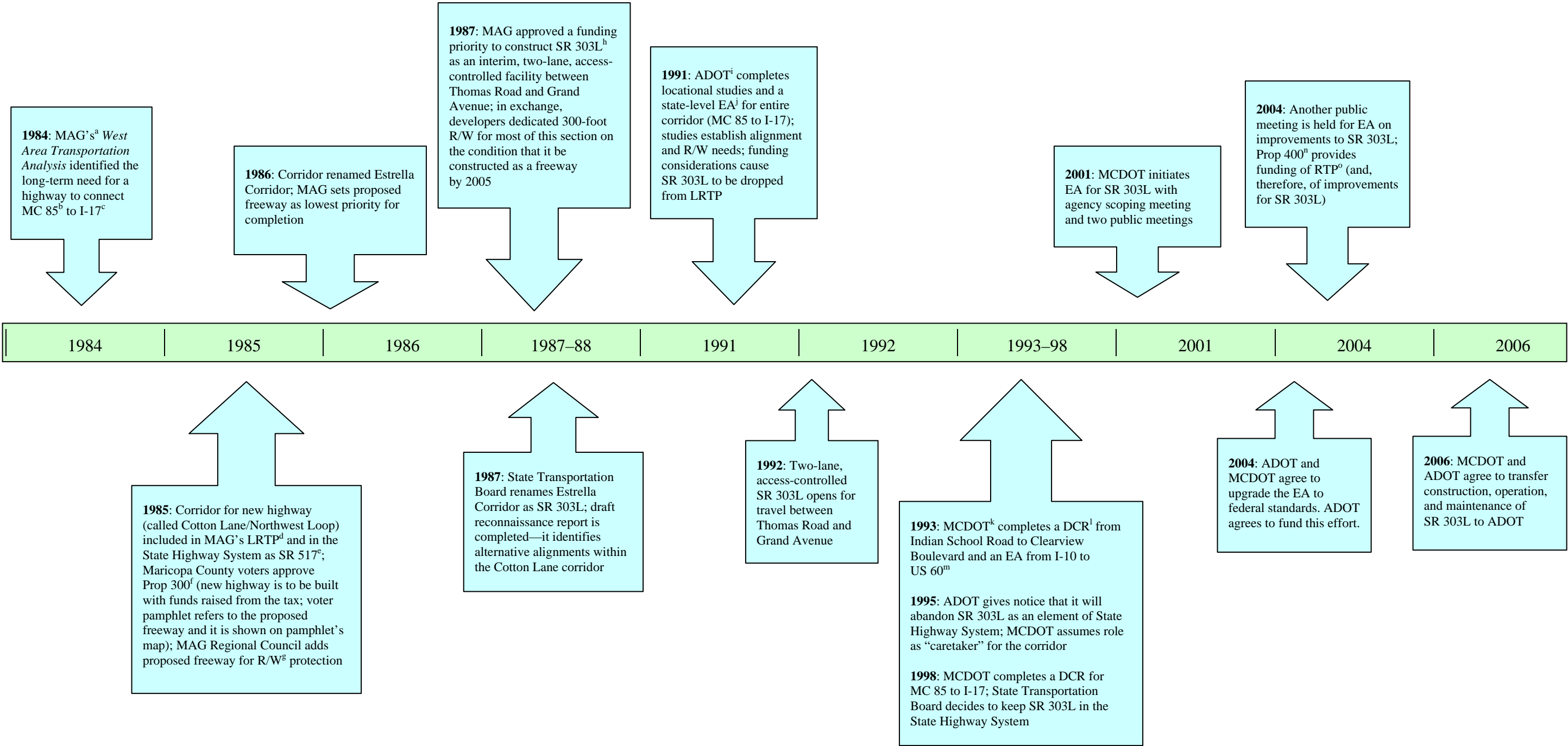
1. Proposed Improvements

The proposed SR 303L project is part of MAG's current (2003) *Regional Transportation Plan* (RTP). This plan was approved by county voters in 2004 (as Proposition 400, a renewal of the 20-year, half-cent sales tax for transportation purposes). In the RTP, SR 303L is planned as a multilane freeway from the proposed SR 801, which would be south of I-10, to I-17.

This proposed improvement project is an important link in this planned regional freeway system. Proposed upgrades include:

- widening SR 303L
- implementing various drainage improvements
- building system traffic interchanges to connect SR 303L with I-10 and the proposed Northern Parkway (a system traffic interchange connects two or more freeway facilities and allows for uninterrupted traffic flow as motorists move from one facility to another)
- building 15 service traffic interchanges at intersections with Study Area arterial streets, including US 60 (a service traffic interchange connects a freeway facility and a cross street—it typically features traffic signals to regulate traffic flow)
- accommodating a mid-mile alignment shift of Northern Avenue to the north (a separate environmental document is being prepared for this project)

Figure 1-3. Project history



^a Maricopa Association of Governments

^b Maricopa County Route 85

^c Interstate 17

^d *Long-Range Transportation Plan*

^e State Route 517

^f 1985 ballot issue to fund facilities in MAG's *Long-Range Transportation Plan*

^g right-of-way

^h State Route Loop 303

ⁱ Arizona Department of Transportation

^j *Environmental Assessment*

^k Maricopa County Department of Transportation

^l *Design Concept Report*

^m United States Route 60

ⁿ 2004 ballot issue to fund facilities in MAG's *Regional Transportation Plan*

^o *Regional Transportation Plan* (MAG 2003)

The programmed MAG RTP funding provides for improvements to SR 303L that would result in an urban freeway with three general purpose lanes in each direction after the initial construction phase. The freeway would be fully access-controlled, which means that it would pass under or over cross streets, allowing for uninterrupted traffic flow. The high-occupancy vehicle (HOV) lanes on I-10 at the connection with SR 303L would be accommodated. At ultimate build-out, the freeway would have four general purpose lanes and one HOV lane in each direction. These ultimate configuration improvements are not currently funded or programmed in the MAG RTP.

Lanes functioning as outside lanes at the end of initial construction would remain the outside lanes at ultimate build-out. To achieve ultimate build-out, lanes would be added to the inside, i.e., on land in the median. Auxiliary lanes are planned between each service traffic interchange and leading into and away from the two planned system traffic interchanges. The improved freeway would have a rolling profile where, in most cases, it would be elevated over existing cross streets and return to near ground level between cross streets.

2. No-Build Alternative

The No-Build Alternative, which would consist of not constructing improvements to SR 303L, is also considered in this document.

E. General Project Schedule and Funding

While construction of the proposed SR 303L improvements would not begin until 2011, ADOT has programmed the proposed improvements for the initial phase into its current *Five-Year Transportation Facilities Construction Program, 2009–2013* (Table 1-1, on this page).

Table 1-1. Funding schedule for proposed improvements to SR 303L, I-10 to US 60

Activity	FY ^a 2009	FY 2010	FY 2011	FY 2012	FY 2013	Summary
R/W ^b preservation	—	—	\$10.0	\$10.0	\$10.0	\$30.0
Design	\$13.8 ^c	\$11.3	8.5	20.0	—	53.6
R/W acquisition	10.0	10.0	—	70.0	—	90.0
Construction	—	—	250.0	205.0	155.0	610.0
Total	\$23.8	\$21.3	\$268.5	\$305.0	\$165.0	\$783.6

Source: Arizona Department of Transportation (2008)

^a fiscal year ^b right-of-way ^c all values in millions of 2008 dollars

Additional funding for this project in the amount of \$327 million has been included in the MAG RTP for future years, but has not been programmed by ADOT.

Part 2. Project Purpose and Need

Improvements to the transportation system in the SR 303L Study Area are needed to:

- accommodate existing and projected local, regional, and interstate travel demand, including truck traffic
- provide acceptable traffic performance
- conform to local and regional development and transportation plans

The purpose of the proposed project is to improve the existing SR 303L transportation facility from I-10 to US 60 and meet the above-described needs through:

- provision of an improved connection to the US 60/US 93 corridor between Phoenix and Las Vegas, Nevada
- completion of an important link in the MAG Regional Freeway System (RFS) that accommodates regional growth and provides improved traffic conditions for local and regional traffic
- integration of the existing facility into a consolidated local drainage system
- provision of a transportation facility that responds to local and regional development and transportation plans

A. Need for the Proposed Project

1. Connection of West Phoenix Metropolitan Area to Northwest Arizona and Nevada

To achieve and maintain acceptable traffic conditions on US 60 in coming years, ADOT has limited choices. In terms of physical changes, ADOT has few options for upgrading US 60 from southeast of the SR 303L intersection to the State Route 101 Loop (SR 101L) interchange. Addressing increasing traffic congestion along this stretch of US 60 is largely confined to facing the issue from the demand side: diverting long distance, through-traffic to another route. One purpose of the proposed SR 303L project is to create a primary diversion route for US 60 through-traffic.

US 60, at the northern end of the SR 303L Study Area, serves as a continuation of US 93, which links Phoenix to Interstate 40 (I-40) east of Kingman and to Interstate 15 (I-15) in Las Vegas. However, west of I-17, no continuous major transportation facility links I-10 and US 60 to serve the public's transportation needs to enter and leave the northwestern Phoenix metropolitan area. Currently, the Arizona portion of US 93 is being upgraded to a four-lane divided highway, and a bypass of Wickenburg is also planned. This upgrading of US 93 reflects the increasing importance of this route as a carrier of intercity and interstate traffic.

With the proposed improvements, SR 303L would efficiently connect I-10 in the west Phoenix metropolitan area with the US 60/US 93 corridor. At present, the efficiency of the existing SR 303L is deteriorating. Currently, the traveling public has four primary ways to enter the Phoenix metropolitan area from US 93, northwest of the Study Area:

1. US 60 to SR 101L
2. SR 74 to I-17
3. US 60 to the existing SR 303L
4. US 60 to I-17 at Thomas Road

As will be shown in the following discussion, US 60 is overburdened southeast of the SR 303L intersection. It was not designed to handle heavy volumes of interstate and regional traffic. The proposed SR 303L improvements are the most promising and viable way to relieve traffic congestion on US 60.

Figure 2-1, on page 13, shows the SR 303L Study Area in relation to other regional highways. It also shows the study areas for other proposed improvements to SR 303L and the study areas for the proposed SR 801 freeway between SR 85 and State Route 202 Loop (SR 202L).

The US 60 corridor southeast of the existing SR 303L connection is becoming increasingly urban. This portion of US 60 does not have operational characteristics consistent with being considered part of the RFS (i.e., freeways identified in the RTP) because 19 traffic signals have been installed in the 11-mile distance between SR 303L and SR 101L (one signal every 0.6 mile). Because of the diagonal orientation of US 60, good signal progression and smooth-flowing traffic have proved difficult to achieve. With planned improvements, this portion of US 60 would be an “enhanced arterial/limited expressway,” with six lanes in each direction and most, if not all, of the traffic signals remaining.

SR 74 runs east–west between US 60 and I-17 on the northern edge of the Phoenix metropolitan area. It does provide a free-flow, two-lane rural highway linking US 60 to I-17. This route is and will continue to be used by some motorists headed for the northern, central, or eastern parts of the metropolitan area. However, this route is fairly distant from the Study Area and does not serve the majority of the truck traffic on US 60.

Thus, while US 60 and SR 74 offer routes connecting highways in northwestern Arizona with the Phoenix metropolitan area, neither offers as efficient and direct a connection with I-10 in the west Phoenix metropolitan area as would SR 303L with the proposed improvements.

Truck traffic is a special component of US 60 long-distance travel. A roadside interview survey with truckers was conducted by MAG on major highways serving the Phoenix area (MAG 2001). The survey found that the combined routes of US 60 and US 93 west and north of Wickenburg served 1,809 trucks per day, accounting for 23 percent of the total vehicles on those highways. For comparison, on I-10, which is a true Interstate Highway and carries more interstate freight, the share is around 35 percent. Of the trucks discussed in the MAG 2001 study, 65 percent were passing through the Phoenix area and 35 percent were headed for destinations within the metropolitan area. In the urban area, the primary destination was the I-10 corridor west of I-17, where warehousing and intermodal facilities are located. The primary destination for through-trucks was I-10 east toward Tucson and New Mexico.

Traffic classification counts completed in 2001 by MCDOT on US 60 near SR 303L and on SR 303L indicated that approximately 30 percent of the truck traffic entering the urban area on US 60 used SR 303L. At that time, truck traffic on SR 303L amounted to approximately 24 percent of all vehicles using that route. Therefore, the existing SR 303L is serving as a truck diversion route for US 60 because it provides a relatively free-flow route to I-10.

In 2004, MCDOT updated data on truck travel patterns in an origin-destination study specifically for SR 303L (see Table 2-1, on this page). This study indicated that trucks made up 15 percent of the existing traffic on SR 303L. These data further indicated that 38 percent of the trucks were passing through the metropolitan area, 25 percent were going to destinations within the metropolitan area, and 37 percent were local trips (those originating from and destined to a location along SR 303L). Truck traffic into the area is expected to continue to increase as the Phoenix metropolitan area and the state continue to develop, but through-truck trips are expected to become a smaller and smaller portion of the traffic stream as the Study Area becomes urbanized.

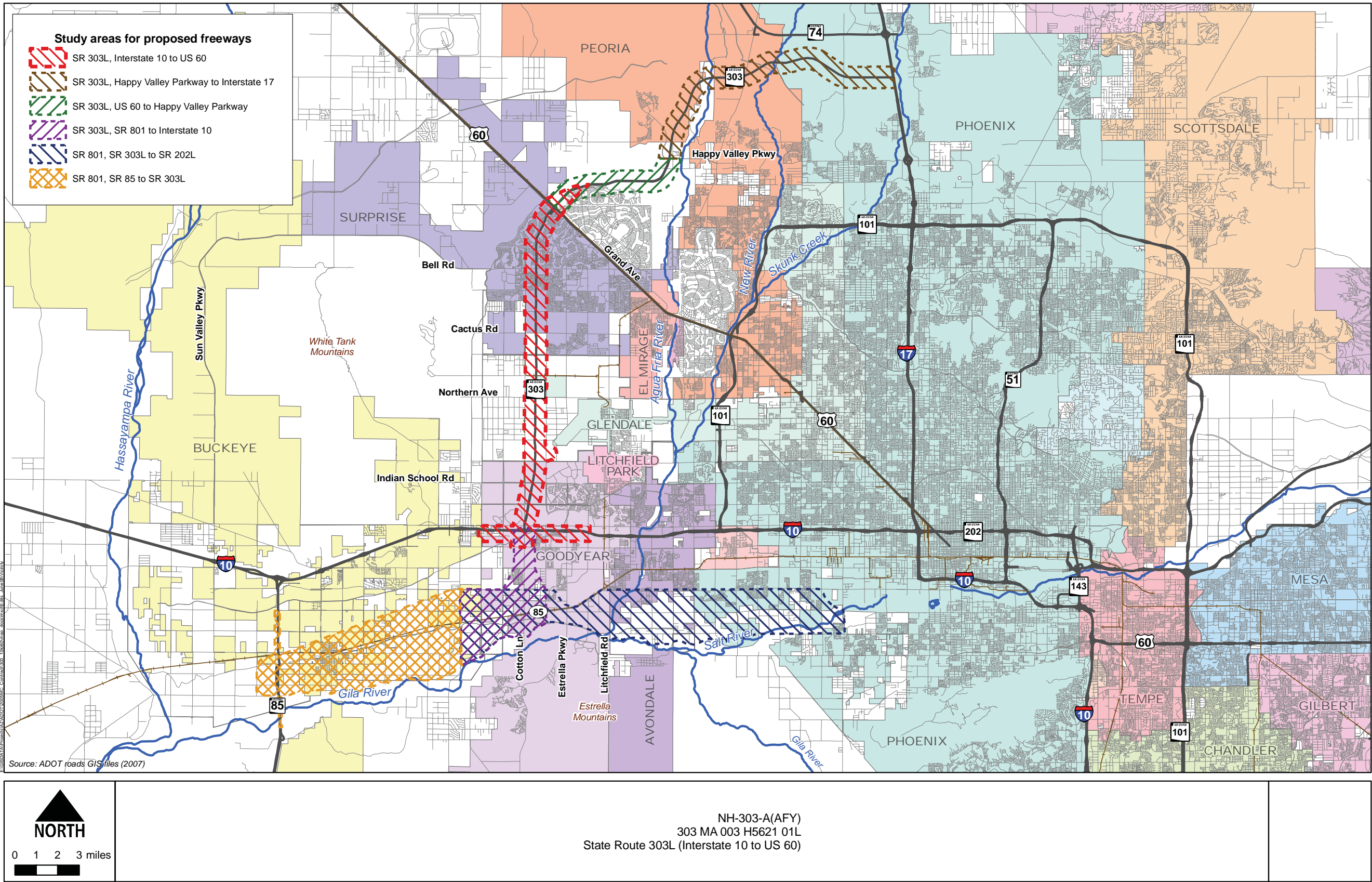
Table 2-1. Existing and future SR 303L truck volumes

Year	Average daily traffic	Truck trips per day				Trucks as a percentage of ADT ^{a,b}
		Local	Metropolitan area	Through	Total	
2003 (existing SR 303L)	9,800	544	368	559	1,471	15.0
2030 (no build)	27,000	2,198	735	1,117	4,050	15.0

^a average daily traffic

^b based on *Loop 303 Truck Origin-Destination Study*, 2004, Maricopa County Department of Transportation

Figure 2-1. Project vicinity



With no changes to the existing SR 303L roadway, traffic signals would eventually be needed at most, if not all, of the cross streets. With more traffic signals, fewer trucks would divert from US 60 to SR 303L and those nondiverted trucks would remain on US 60 and have to encounter 19 traffic signals before reaching SR 101L. Additional noise from trucks using this portion of US 60 could not be effectively mitigated because of the frequency of intersecting streets. Furthermore, this increased truck component would contribute to US 60 becoming more and more undesirable in terms of traffic performance and would also increase air quality impacts.

SR 74 provides a free-flow, two-lane rural highway linking US 60 to I-17. This route is and will continue to be used by some truck drivers headed for the northern, central, or eastern parts of the metropolitan area. SR 74, however, is not designed to accommodate heavy volumes of truck traffic.

US 60 to I-17 at Thomas Road offers truck drivers arriving from the northwest the ability to reach destinations near the Phoenix urban core. However, it involves considerable traffic congestion and numerous traffic signals. Driving time is substantially greater compared with using a freeway route. For some origins and designations, however, this is still an appropriate truck route.

While a major transportation facility is needed to accommodate regional growth in and near the Study Area (see next section), meeting the demand of regional and interstate truck traffic for efficient access to I-10 in the west Phoenix metropolitan area and reducing truck traffic volumes on US 60 southeast of the SR 303L intersection are also important needs.

2. Accommodation of Regional Growth and Linkage to Regional Freeways

With regional growth in population, employment, and housing comes regional mobility needs. Vehicle miles traveled are projected to outpace socioeconomic trends, as they typically have in Phoenix since the 1950s.

From the early 1950s to the mid-1990s, Maricopa County's population grew by more than 500 percent (while the U.S. population as a whole was increasing by approximately 70 percent). Rates of population, employment, and housing growth experienced since the 1950s are projected to continue through 2030. Maricopa County remains one of the most rapidly growing counties in the United States. Between 2000 and 2006, its population increased 23 percent, to nearly 3.8 million (Arizona Department of Economic Security [ADES] 2007). That population is expected to nearly double by 2030, to 6.3 million.

The SR 303L Study Area is about 18 miles long and 1 mile wide, at the edge of the rapidly expanding cities of Goodyear and Surprise (at the southern and northern ends of the corridor,

respectively). In addition to the Pebble Creek development (in the south) and the Sun City Grand development (in the north), numerous additional developments are planned or underway throughout the Study Area. For example, a large residential and commercial development is proposed at the planned junction of SR 303L and the proposed Northern Parkway.

Remarkable growth in both population and employment is projected within the SR 303L corridor over the next three decades. Population is expected to grow more than 169 percent, from just over 146,000 in 2005 to nearly 394,000 by 2030. The central portion of the Study Area and general vicinity currently lack the transportation facilities and infrastructure necessary to adequately accommodate this projected growth.

Accompanying the projected population growth is the rapid expansion in the number of dwelling units in the corridor, from over 68,000 in 2005 to around 173,000 in 2030. Underlying this estimate is an average persons-per-dwelling unit expansion from 2.14 in 2005 to 2.28 in 2030, reflecting the transition of retirement-oriented development patterns to more family-oriented ones in the future. Families with children create more transportation demand than do retired people. Taking children to school, doctor's appointments, shopping, recreational and social activities, lessons, etc., generates more trips per household. Retired people tend to avoid travel during peak demand times. They also tend to own fewer vehicles per household.

In the same vein, estimated employment in 2005 of over 34,000 in the general Study Area vicinity is projected to increase 395 percent to over 170,000 by 2030. This increase is based on a decade-based average growth rate of 111 percent.

Over time, a commensurate increase in development density/intensity is projected to occur as the corridor character changes from rural to suburban-urban as future residents and, to a lesser extent, employment opportunities locate within the Study Area. Population density in 2005 in the Study Area (858 persons per square mile) is projected to grow by 169 percent by 2030 (to 2,309 persons per square mile). This mirrors the projected changes in employment density in the general Study Area vicinity by 2030 (from 202 employees per square mile in 2005 to 999 employees per square mile in 2030).

As illustrated by Table 2-2, on this page, a higher growth rate occurs from 2005 to 2020 than from 2020 to 2030. This slowing in projected growth is primarily attributable to diminishing land development opportunities as the Study Area approaches build-out.

Table 2-2. Population and employment, 2005–2030

Year^a	Population	Employment	Employment (% of total population)	Dwelling units	Population density^b	Employment density^c
2005	146,286	34,427	24%	68,470	858	202
2010	221,309 (51% ^d)	58,215 (69%)	26%	98,625 (44%)	1,297 (51%)	341 (69%)
2020	328,481 (48%)	119,396 (105%)	36%	143,979 (46%)	1,926 (48%)	700 (105%)
2030	393,916 (20%)	170,476 (43%)	43%	172,905 (20%)	2,309 (20%)	999 (43%)
Change: 2005– 2030	+169%	+395%	Not applicable	+153%	+169%	+395%

^a Projections are interpolated from the Maricopa Association of Governments' *Socioeconomic Projections of Population, Housing and Employment by Municipal Planning Area and Regional Analysis Zone*, April 2007

^b persons per square mile

^c employees per square mile

^d Percentages in parentheses represent the percentage change from the previous data year.

SR 303L is a part of a planned system of freeways. With its extension from US 60 to I-17, it would serve as a critical connection between I-10 and I-17. It would be a northwestern “outer belt” portion of the RFS farther west than SR 101L. Since inclusion in the State Highway System in 1985, substantial right-of-way (R/W) has been obtained and the existing, interim roadway was constructed.

Proposed improvements to SR 303L would create the only regional corridor to directly serve an area that will someday be home to over 300,000 people. Without this link, residents in the northern portion of the corridor would have to travel 10 to 12 miles to the south on arterial streets to reach I-10 or travel 8 to 10 miles east on arterial streets to reach SR 101L. Arterial streets are not designed to serve such long trips while also handling shorter trips and providing access to commercial and other land uses that develop along these types of streets.

The economic vitality and quality of life of a community the size of the Phoenix metropolitan area depend on a system of major transportation facilities reasonably spaced throughout the area. Such facilities support local travel while also accommodating regional and commercial movement. The SR 303L corridor is 9 miles west of SR 101L, so it is at the outer edge of the range of typical urban

freeway spacing. Fourteen miles farther to the west is the Sun Valley Parkway. These two major roadways (SR 101L and Sun Valley Parkway) are spaced too far away to effectively serve the SR 303L Study Area.

3. Traffic Conditions/Performance

Level of Service

In addition to capacity in terms of vehicles per day (vpd), another way to consider the adequacy of a given road is to examine its ability to deliver a given level of service (LOS). LOS is a qualitative rating of the operating conditions of a road or freeway. Under this six-level, “report card” approach, an “A” represents the least congested traffic conditions and an “F” represents the most congested conditions (see Figure 2-2, on page 19).

LOS characterizes traffic conditions using factors such as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience of motorists. When a road reaches its maximum vehicle capacity, traffic lacks the ability to dissipate even the most minor disruption, and any incident can be expected to produce a serious disruption in traffic flow with extensive traffic back-ups. Additionally, motorists’ maneuverability within an at-capacity traffic stream is extremely limited, adversely affecting their physical and psychological comfort. Because of these factors, most transportation planners strive to design freeways to achieve LOS D or better.

Most of SR 303L operates now at LOS E (considerable traffic congestion, with motorists unable to pass slower-moving vehicles, and inefficient travel) during peak hours. In 2003, the majority of SR 303L was operating at LOS C. Since 2003, traffic volumes have increased from around 8,000 vpd to nearly 20,000 vpd (averaged from MAG 2007 traffic counts at 15 different locations from McDowell to Beardsley roads). Correspondingly, LOS has been degraded to LOS D or E during the peak hours.

Figure 2-2. Level of service



Level of Service A



Level of Service B



Level of Service C



Level of Service D



Level of Service E



Level of Service F

Forecast traffic volumes on US 60 for 2030, southeast of the SR 303L connection, will result in traffic performance on US 60 with an unacceptable LOS. Based on 2004 traffic counts, the existing SR 303L was diverting approximately 3,000 vpd from US 60. Based on the 2030 forecast, an SR 303L improved to freeway status would divert 14,000 vpd from US 60. Through this additional increment of vehicles diverted, US 60 would—with some widening and construction of key grade separations at intersections such as Bell Road—be able to continue to provide an acceptable LOS. Without this diversion of traffic to SR 303L, transportation planners would face substantial traffic congestion and delays on US 60, but have few alternative strategies for addressing the deterioration in LOS.

Traffic Signals

Between I-10 and US 60, SR 303L has 16 urban cross streets, 14 of which are at-grade. With anticipated increased traffic volumes, each of these at-grade intersections would require the installation of traffic signals (five, not counting the signal at US 60, are now signalized). If this were to occur and motorists had to contend with stopping at traffic signals at mile intervals, SR 303L would function more as an urban arterial street instead of as a rural highway (as it does now). The installation of traffic signals at cross streets would reduce travel speed on SR 303L to less than 25 miles per hour (mph) during peak hours. Travel speed is now 60 mph during peak travel hours.

Traffic Volumes

In 1992, when SR 303L first opened to traffic, the road carried 550 to 1,100 vpd. By 2003, traffic grew to 7,267 vpd, an increase of about 560 percent in 11 years. In 2004, MCDOT opened additional road segments between US 60 and Happy Valley Road, in addition to implementing other improvements. Traffic volumes in 2004 ranged from 12,000 to just over 19,000 vpd north of US 60, reflecting the ongoing regional growth and the extension of the road. The road functions as a rural two-lane highway on which the ability to pass slower-moving vehicles is the primary criterion in determining its LOS. Design capacity (LOS C) of SR 303L south of US 60 is estimated to be 7,900 vpd, a volume exceeded regularly as early as 2003. With recently planned and newly constructed improvements, such as new urban signalized intersections with additional turn lanes, the capacity will increase to 13,500 vpd, but travel speed will decrease.

If road capacity is available, traffic forecasts indicate that the volumes on SR 303L could increase from 13,581 vpd in 2004 to 93,000 vpd in 2015 and to around 144,000 vpd in 2030. Such projections indicate ample demand will exist in the corridor to justify construction of a major transportation facility. Without adequate road capacity, motorists would choose less-congested

routes—typically adjacent arterial streets—to reach their destinations, thus shifting traffic congestion from one type of road to another type of road less capable of handling additional traffic. If SR 303L were to remain as it is today, peak-hour traffic congestion would be extensive both on this road and on the parallel arterial streets, including Citrus Road, Cotton Lane, and Sarival Avenue.

If SR 303L were improved to have traffic signals at 1-mile intervals, the average off-peak travel speed with optimal traffic signal progression would be approximately 43 mph. During peak travel times, the average speed could drop to less than 25 mph. Average speeds between 25 and 43 mph would mean that SR 303L would no longer serve its intended regional function.

Such average travel speeds and the likelihood of having to stop at numerous traffic signals would negate the road's planned regional function. Less traffic would be diverted from US 60, Citrus Road, Cotton Lane, and Sarival Avenue. Motorists would seek these other routes not designed for higher-speed travel, and the resultant diversion of traffic would necessitate improvements on these other routes. Trucks and vehicles on longer trips would be subjected to delays and backed-up traffic at numerous signalized intersections and to stop-and-go travel. The result would be increases in traffic congestion, air quality impacts, and travel time along the corridor.

In 2030, the current configuration of SR 303L would need to accommodate projected traffic volumes ranging from 22,600 to 49,700 vpd—on a highway originally designed to carry approximately 7,900 vpd. Near-term planned improvements would increase this capacity to 13,500 vpd. Travel demand in the corridor would exceed planned capacity such that the two- and four-lane road with signalized intersections and left-turn lanes at each mile would function at LOS F for several hours per day. The excess travel demand would also overload adjacent parallel streets. Traffic speeds on the unimproved SR 303L would average 21 mph in 2015 and remain at that level into the future.

4. Consolidation of Drainage Infrastructure

The off-site watershed to the west of SR 303L is largely undeveloped, consisting of desert, mountains, and agricultural fields. Runoff from the White Tank Mountains and the adjacent desert is conveyed overland and within washes, ultimately draining into the Gila River, south of the Study Area.

The existing SR 303L is a two- to four-lane rural highway with at-grade intersections at most 1-mile street crossings and with limited cross-drainage culverts and storm drain systems. Small culverts cross the roadway at approximately a dozen locations. The existing ditches and culverts convey

runoff from routine storms, but are inadequate for larger stormwater flows, i.e., flows resulting from storms expected to occur less frequently than every 2 years.

The Flood Control District of Maricopa County (FCDMC) intends to address the inadequacies of the existing stormwater drainage system. If the proposed improvements were to be built, FCDMC and ADOT would coordinate in consolidating and simplifying the drainage system to better protect the public and land uses in the SR 303L corridor from major storm runoff. Interim drainage outfalls would be constructed during the initial phase of the proposed SR 303L improvements by FCDMC. FCDMC would also handle the construction of ultimate drainage improvements.

B. Conformity with Regulations, Land Use Plans, and Other Plans

The 2003 RTP calls for a new major transportation facility—a freeway that is part of the RFS—to connect I-10 and US 60. To conform to the intent of this regional transportation plan, the proposed improvements are needed.

The Study Area for the proposed improvements encompasses land under the jurisdiction of the Cities of Goodyear, Glendale, and Surprise; Maricopa County; and land under the management of the Arizona State Land Department (ASLD).

All local jurisdictions with responsibility for planning near the SR 303L corridor have recognized the need to improve SR 303L to a freeway facility, and their land use plans and general plans reflect that need. To ensure consistency, conformity, and compatibility, the following general plans were reviewed:

- City of Glendale’s *Glendale 2025: The Next Step General Plan* (2002a) and *Transportation Plan* (2002b)
- City of Goodyear’s *General Plan* (2003)
- City of Surprise’s *General Plan 2020: Imagine the Possibilities* (amended in 2005)
- MAG’s *Valley Vision 2025* (2000) and *Regional Transportation Plan* (2003)
- Maricopa County’s *White Tanks/Grand Avenue Area Plan* (updated 2004); and *2020 Eye to the Future Comprehensive Plan* (updated in 2002)

Applicable land use planning documents for ASLD were also reviewed to determine project conformity. However, the ASLD planning documents do not reflect the need for an enhanced transportation facility.

C. Conclusion

SR 303L is part of the RFS, a planned system of freeways that includes a link between I-10 and I-17 on the west and north sides of the metropolitan area. The proposed project is a vital portion of this planned system. US 60 was not designed to accommodate long-distance, through-traffic—particularly truck traffic headed for I-10 in the west Phoenix metropolitan area—and a need exists to divert such traffic to another route. The RTP calls for upgrading the existing SR 303L to a freeway in part to relieve traffic congestion along US 60 southeast of the SR 303L intersection because options to address deteriorating traffic conditions on US 60 from the SR 303L intersection southeast to the SR 101L interchange are severely limited. The issue is best faced from the demand side: diverting traffic from US 60 to another route.

Improved capacity and LOS on SR 303L are needed to accommodate rapid growth in the volume of traffic as the surrounding land is developed. Additionally, much of the truck traffic from the northwestern part of the state and Las Vegas is headed to warehousing facilities on I-10, west of I-17. Truck traffic needs to be removed from US 60 and diverted to an improved SR 303L to provide a more efficient and direct route that would partially relieve traffic congestion on US 60.

A new major transportation facility would need to be integrated into a planned, consolidated area drainage facility. Such integration would minimize costs by eliminating the need for multiple culverts under the transportation facility because drainage would be collected on the west side of the Study Area and diverted south to the Gila River rather than crossing under the transportation facility—as is currently the case—and then being diverted to the south.

Part 3. Alternatives

This part of the Draft EA describes alternatives for SR 303L that were considered with regard to transportation mode, corridor location, freeway alignment, overall freeway design, and traffic interchange design. A Preferred Alternative is identified to carry forward for further study, along with the No-Build Alternative.

A. Alternatives Considered But Eliminated from Further Study

1. Transportation Mode Alternatives

The Regional Public Transportation Authority, MAG, and ADOT collaborated to develop the RTP (2003). The RTP, when fully implemented, is designed to form an integrated transportation system and to provide accessibility, mobility, and modal choice for residents, businesses, and the economic development of the region. While preparing the RTP, MAG provided 150 public input opportunities and held 117 agency meetings and 173 stakeholder meetings. Public opportunities to help shape the RTP included expert panels, focus groups, special events, workshops, and public hearings.

The RTP recounts regional efforts to evaluate how transportation system management (TSM) and transportation demand management (TDM) programs could maximize roadway efficiency without substantial improvements in physical infrastructure.

- TSM attempts to maximize the safety and efficiency of the future transportation network using such traffic management tools as electronic message signs, traffic signals to meter traffic flow at freeway entrance ramps, closed circuit television cameras to monitor traffic flow, vehicle detectors, and other intelligent transportation system technologies.
- TDM encourages reductions in travel demand in the 2030 transportation network by promoting alternative modes of travel, including carpooling, van pooling, walking, bicycling, alternative work schedules to reduce trips, and telecommuting.

The RTP includes transit improvements: elements of a light rail system, expanded bus rapid transit (BRT) and regional bus service, flexible route transit, and commuter van pools. It also includes the widening of arterial streets, construction of new arterial street segments, arterial street intersection improvements, and the addition of HOV lanes to existing freeways.

Another nonfreeway alternative was considered: land use regulatory actions, which include increasing residential neighborhood densities and redistributing employment centers. The land use actions would intend to alter planned land uses to reduce people's dependency on vehicles and to

decrease demand on the MAG region's transportation network (resulting in increased efficiency of the network). In support, local governments could improve the performance of the regional transit system.

TSM, TDM, and transit improvements would have limited effectiveness in reducing overall traffic congestion in the Study Area and, therefore, would neither meet purpose and need criteria nor adequately address projected capacity and mobility needs of the MAG region. Based on projected regional travel demand and the extent of mobility needs in the MAG region and in the immediate Study Area, arterial street network improvements alone would not meet the needs of the MAG region. Planned land uses and associated densities in the Study Area and immediately adjacent areas are relatively stable in local planning documents. Using regulatory tools to effect change in local land uses or densities is not a viable action. No plans exist to alter planned land uses in the general area, and components to support increased efficiency in the transportation network (e.g., transit, arterial street improvements) have already been incorporated into the RTP.

Despite the improvements identified and planned in the 2003 RTP, MAG determined that additional freeways and freeway capacity—such as the proposed improvements to SR 303L—would be necessary to accommodate the increased travel demand resulting from rapid population growth in the Phoenix metropolitan area. Therefore, the SR 303L Study Team (local jurisdictions and federal, state, and regional agencies) eliminated nonfreeway alternatives from further consideration in the Study Area.

However, upgrading SR 303L to a freeway facility would not preclude transit improvements from occurring in the Study Area. The MAG plan includes BRT service along SR 303L from I-10 to Bell Road and along both Bell Road and I-10. It also includes bus service as part of the “super grid system” on Bell Road from SR 303L eastward. A future park-and-ride lot is planned near the intersection of SR 303L and Northern Avenue. Buses would be able to use the HOV lanes on the ultimate upgraded SR 303L. In the shorter term, all transit vehicles would be able to use the general purpose lanes on SR 303L.

2. Corridor Alternatives

During early public information meetings, members of the public suggested two alternative alignments for SR 303L: Sun Valley Parkway and the planned CANAMEX trade route connecting Canada, the United States, and Mexico. Both alternative corridors are well-removed from the existing SR 303L: 14 miles and 19 miles to the west, respectively. The Sun Valley Parkway would serve development eventually occurring west of the White Tank Mountains. The parkway's

upgrading and extension north to Wickenburg, with a connection to US 60, would be considered in future planning. If and when such an expansion were implemented, some through-traffic might use that corridor to reach I-10 instead of using US 60 and the existing SR 303L. Because the largest share of traffic projected to use SR 303L would originate from places other than US 60 at Wickenburg, the Sun Valley Parkway alternative would not meet the proposed project's purpose and need and was eliminated from further consideration.

Based on analyses contained in the ADOT and MAG final report for the CANAMEX Corridor (ADOT 2000a), the proposed CANAMEX route (located 5 miles west of the Sun Valley Parkway, along Wickenburg and Vulture Mine roads) would divert only a small portion of traffic from the existing SR 303L corridor. Because of its distance from regional traffic needs and growth, this alignment would not satisfy the project purpose and need and was eliminated from further study.

3. Alignment Alternatives

Based on freeway spacing (see Part 2, *Project Purpose and Need*, on page 10) and avoidance of existing urban development, SR 303L's general corridor was initially identified in the *West Area Transportation Analysis* (MAG 1984). Through that study, it was determined that the logical location for SR 303L would be west of Luke AFB and east of the White Tank Mountains.

In the late 1980s and early 1990s, various alignment studies were conducted. At that time, nonagricultural land use in the area west of Cotton Lane consisted of a large rural subdivision, a state prison, and an abandoned horse racetrack (all of which are still there). Between Cotton Lane and Sarival Avenue, the majority of land was in agricultural production. The Luke AFB crash zone was, and continues to be, located east of Sarival Avenue. Avoidance of the state prison and the Luke AFB crash zone led to the selection of a preliminary alignment between Cotton Lane and Sarival Avenue.

The *Estrella Freeway Draft Reconnaissance Report*, prepared in February 1987, assessed various alignments for SR 303L (at that time called the Estrella Freeway) from MC 85 to I-17 (Cella Barr & Associates 1987). Within the project limits from the Gila River to US 60, eight alignment alternatives were evaluated on or between Cotton Lane and Sarival Avenue. Based on that evaluation, and generally for the reasons already discussed, the basic alignment was selected along or near Cotton Lane. This alignment was refined in *Estrella Freeway Preliminary Location Plan and Profile* (Cella Barr & Associates 1991).

In 1992, ADOT designed and constructed the existing SR 303L roadway. To construct the roadway, irrigation systems were modified and utilities were relocated to facilitate future freeway

construction. The alignment has been included in the planning documents for the Cities of Goodyear, Glendale, and Surprise, and construction of the roadway has spurred development along the length of the corridor, particularly near the northern and southern ends (see Part 2, *Project Purpose and Need*, on page 10). As a result, the existing SR 303L alignment has proved to be a logical place to construct improvements to upgrade the roadway to freeway status. Any other alignment would be prohibitively disruptive to existing and planned residential, commercial, and agricultural uses. All other alignments were eliminated from further study.

4. Overall Freeway Design Alternatives

The existing SR 303L crosses 16 arterial streets between I-10 and US 60. Two of the crossings—at Clearview and Mountain View boulevards—are already grade-separated (without service traffic interchanges). At the remaining 14 crossings, two design alternatives were considered: either an at-grade, signalized intersection or a grade-separation with or without a service traffic interchange.

If the crossings were to be signalized, SR 303L would function as an arterial street, which would offer little advantage over other arterial streets. For reasons explained in Part 2, *Project Purpose and Need*, this alternative crossing design would not meet the purpose and need for the project and was, therefore, eliminated from further study.

Grade separations—with or without service traffic interchanges—were carried forward as design alternatives because only they could provide the free flow of traffic necessary to meet criteria discussed in Part 2, *Project Purpose and Need*. Part 2 also describes the deficiencies of a roadway with traffic signals at 1-mile intervals and the necessity for a fully access-controlled, grade-separated urban freeway to meet the proposed improvement project's purpose and need criteria.

5. Traffic Interchange Design Alternatives

To meet traffic needs and growth demands in the West Valley, numerous traffic interchange design alternatives were developed, evaluated, and reviewed from 2002 through 2008 by MCDOT, ADOT, and other agency stakeholders, including the Cities of Goodyear, Glendale, and Surprise; Luke AFB; FCDMC; and FHWA. Various system traffic interchange design alternatives—at I-10 and at the proposed Northern Parkway—and service traffic interchange design alternatives were evaluated. Table 3-1, on page 28, provides illustrations and descriptions of typical system and service traffic interchanges. Tables 3-2 and 3-3, on pages 29 and 30, identify the various alternative configurations evaluated for each system traffic interchange for SR 303L, including engineering and traffic operational issues, R/W needs, and potential environmental impacts.

Table 3-1. Traffic interchange descriptions


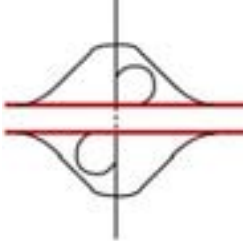
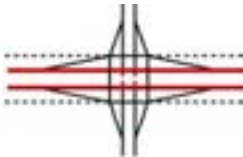
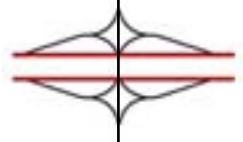


Illustration and type	Description
<i>Service traffic interchanges</i>	
 <p>Diamond</p>	<p>A basic four-ramp interchange between a freeway and a cross street. The four diagonal ramps, one in each quadrant, suggest a diamond shape. This is the most widely used service traffic interchange type.</p>
 <p>Partial Cloverleaf</p>	<p>A service traffic interchange that provides loop on-ramps to the freeway in addition to four spread diamond-type ramps. This interchange is suitable for large-volume turning movements. Loop off-ramps are not desirable.</p>
 <p>Platform Diamond</p>	<p>A service traffic interchange option used when traffic volumes and operational constraints do not permit left turns from the cross street. The interchange is formed by diamond-type ramps from the freeway and the cross street intersecting at a separate platform located between the highway and the cross street where the turning movements are made.</p>
 <p>SPUI</p>	<p>A single-point urban interchange (SPUI) shifts the intersection of the ramps and the cross street toward the center of the service traffic interchange. The use of “inside left turns” reduces the number of traffic signal phases and increases the left-turn efficiency of the interchange.</p>
<i>System traffic interchanges</i>	
 <p>Full Directional</p>	<p>A four-level interchange used where two freeways intersect to accommodate a high demand for all turning movements. It is designed to maintain higher speeds and uninterrupted traffic flow. This interchange type is commonly referred to as a system traffic interchange.</p>
 <p>"T" Interchange</p>	<p>This system traffic interchange option is used when one freeway terminates into another freeway. It is designed to maintain higher speeds and uninterrupted traffic flow.</p>

Table 3-2. SR 303L and I-10 system traffic interchange alternatives

System traffic interchange alternatives	Engineering and traffic operational issues^a	Right-of-way (R/W)	Potential environmental impacts
Alternative 1 Base configuration: T interchange	Poor access; needs to place the Roosevelt Irrigation District canal in a structure over a major system ramp; doesn't allow for the extension of SR 303L ^b to the south	Needs R/W from Canyon Trails residential development	Residential R/W take and traffic lanes constructed close to sensitive noise receivers
Alternative 2 Depress SR 303L and Cotton Lane under I-10 ^c	Eliminated because of profile conflicts	Needs R/W from Canyon Trails	Residential R/W take and traffic lanes constructed close to sensitive noise receivers
Alternative 3 Depress frontage roads under I-10	Eliminated because of profile issues	Needs R/W from Canyon Trails	Residential R/W take and traffic lanes constructed close to sensitive noise receivers
Alternative 4 (Preferred) Depress SR 303L under McDowell Road (MP 4.0) and I-10; shift I-10 north	Balanced access to all quadrants	Avoids R/W take at Canyon Trails; requires R/W from Goodyear Market Place Swap Meet and undeveloped land	No residential R/W take; shifts traffic lanes farther away from noise receivers
Alternative 5 Same as Alternative 4; eliminates certain frontage roads	Better access on west side than on east side	Avoids R/W take at Canyon Trails; requires R/W from Goodyear Market Place Swap Meet and undeveloped land	No residential R/W take; shifts traffic lanes farther away from noise receivers
Alternative 6 Same as Alternative 4; eliminates certain frontage roads and adds additional ramps on east side of I-10	Restricts access to east side of Cotton Lane	Avoids R/W take at Canyon Trails; requires R/W from Goodyear Market Place Swap Meet and undeveloped land	No residential R/W take; shifts traffic lanes farther away from noise receivers

^a Engineering and traffic operational issues include level of service, capacity, connectivity, geometry, structures, drainage, constructability, and cost. Issues were reviewed, as appropriate, for each alternative and documented in the *Draft Design Concept Report, SR 303L, I-10 to US 60* (MCDOT 2006).

^b State Route 303 Loop

^c Interstate 10

Table 3-3. SR 303L and Northern Parkway system traffic interchange alternatives

System traffic interchange alternatives	Engineering and traffic operational issues^a	Right-of-way (R/W)	Potential environmental impacts
Alternative 1 Interchange on half-mile section line, with directional ramp at Olive Avenue	Some connectivity issues; needs half-diamond interchange; moderate cost	Requires about 40 acres of R/W	Area is farmland; no relocations required; no natural or cultural resources present
Alternative 2 Full directional interchange on half-mile section line	Access issue to connect to Olive Avenue; construction phasing issues; moderate cost	Requires about 40 acres of R/W	Area is farmland; no relocations required; no natural or cultural resources present
Alternative 3 (Preferred) T-interchange on half-mile section line with frontage roads	Best connectivity to Northern Parkway and SR 303L ^b ; provides split diamond traffic interchange at Northern and Olive avenues; highest number of free-flow connections; highest cost	Needs most amount of R/W—about 65 acres; no displacements	Area is farmland; no relocations required; no natural or cultural resources present

^a Engineering and traffic operational issues include level of service, capacity, connectivity, geometry, structures, drainage, constructability, and cost. Issues were reviewed, as appropriate, for each alternative and documented in the *Draft Design Concept Report, SR 303L, I-10 to US 60* (MCDOT 2006).

^b State Route 303 Loop

Early in the planning process, it was determined that the SR 303L profile would dictate the configuration of the service traffic interchanges. The profile options for SR 303L were:

- remain at-grade, with cross streets spanning SR 303L on bridges
- be elevated over cross streets, which would remain at-grade
- be depressed beneath the cross streets, which would remain at- or near-grade

The options of cross streets spanning or going beneath SR 303L were examined for each traffic interchange. Depressing SR 303L would be viable between US 60 and Greenway Road (it is already depressed between US 60 and Bell Road) and between Thomas Road (MP 5.0) and I-10 because of terrain. A depressed freeway between Greenway Road and Thomas Road would be difficult to drain and, therefore, more expensive to maintain because it would require pump stations and would create excessive amounts of excavated material requiring disposal. Technical memoranda were prepared to address profile issues for most segments of SR 303L and are included in the DCR. In general, the local jurisdictions prefer that SR 303L be elevated over or depressed beneath the cross streets. These options were carried forward.

6. Drainage Feature Alternatives

To address regional flood control issues, FCDMC—with participation by ADOT—is preparing the *Loop 303 Corridor/White Tanks Area Drainage Master Plan Update*, to be completed in late 2008. Within the immediate watershed, stormwater generally flows from northwest to southeast and in many locations would be isolated by the proposed SR 303L improvements. A component of this project within the 220-square-mile watershed is a proposed collection facility west of, and paralleling, SR 303L to intercept flows originating higher in the watershed and to convey those flows to the Gila River. A number of alternatives were investigated by FCDMC for outfall channel and detention basin locations, but hydrologic and hydraulic constraints limited the available alternatives. By mutual agreement among FCDMC, MCDOT, and ADOT, the basic concept for the off-site drainage system for SR 303L is proposed to be the system derived through the area drainage master plan (ADMP). This system is designed to meet both FCDMC and ADOT guidelines. A map of the regional drainage system and a cross-section of a concrete channel along SR 303L are included in Appendix A, *Drainage Information*.

B. Alternatives Considered for Further Study

1. No-Build Alternative

Under the No-Build Alternative, no capacity or main line widening improvements to SR 303L between I-10 and US 60 would occur and SR 303L would remain much as it is today. Under the No-Build Alternative, all major crossings of SR 303L between I-10 and US 60 would be signalized at appropriate future dates based on area growth.

The No-Build Alternative would result in a gradual transformation of SR 303L from a rural highway to an urban arterial street. Part 2, *Project Purpose and Need*, on page 10, describes deficiencies and problems associated with a decision to not address the need for a major transportation facility to meet increasing travel demand. The No-Build Alternative failed to meet purpose and need criteria, but was carried forward for comparative purposes for assessing the impacts and suitability of the build alternative.

2. Preferred Alternative

The Preferred Alternative, at build-out, would consist of improvements to the existing SR 303L to create a ten-lane (four general purpose lanes and one HOV lane in each direction) fully access-controlled freeway with auxiliary lanes between traffic interchanges. The proposed improvements include 2 system traffic interchanges, 15 service traffic interchanges, and various drainage

improvements. These ultimate configuration improvements, however, are not currently funded or programmed in the MAG RTP.

The following sections describe how the proposed improvements would address Study Area transportation needs, as discussed in Part 2, *Project Purpose and Need*, on page 10.

Connection of West Phoenix Metropolitan Area to Northwest Arizona and Nevada

An improved SR 303L would be a vital link in a system of freeways and highways providing the most efficient way to travel from the Phoenix metropolitan area to Las Vegas. The proposed improvements to SR 303L would provide a third major highway corridor for the northwestern Phoenix metropolitan area (in addition to the route from US 60 to SR 101L and the route from SR 74 to I-17). The proposed improvements to SR 303L would enhance the connection from downtown Phoenix on I-10 to I-40 and to Las Vegas.

Improving SR 303L to freeway status would divert traffic from parallel roads and, perhaps, postpone the time when these roads would need to be widened. This time buffer could help county and local municipality budgets and increase the potential for road improvements being built by developers as the area develops. SR 303L would also divert some traffic from existing urban arterial streets. For example, up to 3,000 vpd would be diverted from Reems Road and Sunrise Boulevard through the Sun City Grand area in 2020 if the proposed improvements were completed.

SR 303L now diverts approximately 3,000 vpd from US 60. Based on MAG's 2025 traffic forecast, an SR 303L functioning with traffic signals at 1-mile intervals would continue to divert 3,000–5,000 vpd from US 60. If improved to freeway standards, SR 303L would divert 14,000 vpd and enable US 60 to continue providing acceptable levels of service with some widening and perhaps construction of key grade separations. Without upgrading the existing SR 303L to freeway status, traffic congestion on US 60 between SR 303L and SR 101L would continue to increase, with no plans in place that would solve the growing traffic congestion problem.

A freeway-status SR 303L would intercept US 93/US 60 truck traffic heading to the I-10 warehousing hub located west of I-17. This more direct and efficient truck routing would remove a substantial portion of the trucks traveling on US 60 southeast of the SR 303L intersection, thereby alleviating congestion on the portion of US 60 leading to SR 101L (see Table 3-4, on page 33).

Table 3-4. Existing and future SR 303L truck volumes with Preferred Alternative

Year (corridor design)	Average daily traffic	Truck trips per day				Trucks as a percentage of ADT ^{a, b}
		Local	Metropolitan area	Through	Total	
2003 (existing SR 303L)	9,800	544	368	559	1,471	15.0
2015 (six-lane configuration)	100,000	5,550	551	838	6,939	6.9
2030 (ten-lane configuration)	150,000	8,325	735	1,117	10,177	6.8
2030 (no build)	27,000	2,198	735	1,117	4,050	15.0

^a average daily traffic^b based on *Loop 303 Truck Origin-Destination Study*, 2004, Maricopa County Department of Transportation

Accommodation of Regional Growth and Linkage to Regional Freeways

Upgrading SR 303L to freeway status would provide relief for traffic congestion on US 60, thereby benefiting the region's overall transportation network. It would also provide an immediate local benefit by drawing traffic away from nearby arterial streets. The proposed improvements would complement the plans, policies, and growth objectives of municipalities in the region and accommodate the region's population growth.

A Link in the Regional Freeway System

SR 303L is part of a planned system of freeways linking I-10 to I-17 on the west and north sides of the metropolitan area. The proposed project is a vital portion of this planned system. Upgrading SR 303L to a freeway would divert long-distance traffic from US 60, which is not designed to accommodate this type of traffic.

A Regional Route

An upgraded SR 303L would serve the developing area west of the Agua Fria River and east of the White Tank Mountains. Urban development is rapidly expanding in the cities of Goodyear and Surprise, at the southern and northern ends of the corridor, respectively. The proposed improvements to SR 303L would provide a regional freeway to accommodate through traffic and remove it from the local arterial street network, which is designed for medium-length trips.

Improving SR 303L to freeway standards would divert traffic from 1) parallel local streets such as Cotton Lane and Sarival Avenue, which may postpone the time when these streets need to be

widened, and 2) urban arterial streets such as Reems Road and Sunrise Boulevard. The new freeway facility would be consistent with the needs and planning for the region by reducing travel demand on local arterial streets and improving traffic conditions in the corridor.

Facilitation of Efficient Expansion of the Metropolitan Area

The SR 303L corridor crosses a region initially developed for agricultural purposes. As a result, the corridor has an established water supply, is flat and easy to develop, and is served by an existing grid of arterial streets. The area is primed to accommodate future urban growth.

SR 303L was first placed in the LRTP in 1985, after a study had recommended this route (but also indicated that the route may not be needed as a freeway prior to 2005). The study recommended that the R/W preservation process begin for the freeway routing. ADOT worked with property owners to have much of the freeway R/W dedicated in exchange for the early construction of the freeway facility in the corridor.

This corridor reflects effective community planning where regional infrastructure needs have been identified, planned, and designed well in advance of development to minimize conflicts and to promote logical development patterns. Current developers are fully aware of the proposed improvements and are planning their developments to take advantage of the mobility and access that would be provided by the proposed upgrades to SR 303L. With the proposed improvements to SR 303L and the established grid of arterial streets, the corridor would be well-suited to support substantial growth and provide the transportation infrastructure necessary to serve that growth. In contrast, areas north of the corridor have few established roads, numerous natural and man-made constraints to developing a road system, and no planned freeways. Growth in the SR 303L corridor is already more consistent with sound regional development planning than most other areas adjacent to the current urbanized area. Implementation of the proposed improvements would accommodate development in the corridor in a rational manner and perhaps delay development in other areas less compatible with efficient regional development patterns.

Accommodation of Traffic Conditions/Performance

Level of Service and Traffic Volumes

In 2007, SR 303L had nearly 20,000 vpd (averaged from MAG traffic counts at 15 different locations from McDowell to Beardsley roads) and was operating at LOS D or E during the peak hours. In 2018, SR 303L with the proposed initial improvements (three lanes in each direction)

would have around 105,000 vpd at LOS C. By 2030, traffic conditions on SR 303L would deteriorate to LOS E, with 144,000 vpd.

Under the ultimate configuration (four lanes and an HOV lane in each direction), the roadway performance would improve to LOS C, with an average daily traffic (ADT) volume of 155,000 vpd. Traffic conditions would not deteriorate to LOS E—at an ADT of around 200,000 vpd—until an uncertain date beyond 2035.

A ten-lane freeway (four general purpose lanes and one HOV lane in each direction) with auxiliary lanes between on- and off-ramps would be expected to accommodate projected traffic volumes with only modest slowing during peak travel demand conditions. (An auxiliary lane begins at an on-ramp and ends at the next off-ramp, without passing through any traffic interchanges in between. It helps motorist merge onto or exit the freeway.) All freeway segments, weaving areas, ramps, and signalized intersections are expected to operate at an acceptable LOS with the proposed ultimate improvements.

Traffic would be relatively free-flow, and average travel speeds would be approximately 65 mph during most of the day. This type of freeway would fully serve the regional road functions described earlier and would continue to serve the corridor well beyond the current forecast growth in the area. The average peak-hour speed on SR 303L in 2030 would be between 53 and 65 mph with the proposed improvements and between 12 and 29 mph without the improvements.

Traffic Signals

With improvements to SR 303L, signalized intersections with arterial streets would remain, but the freeway would be grade-separated from all of these, using service traffic interchanges instead. Traffic on the freeway would flow unimpeded by the arterial street connections. System traffic interchanges would be provided at I-10 and the proposed Northern Parkway to enable efficient connections between SR 303L and these other freeway facilities. The three-level service traffic interchange at US 60 would need traffic signals but would provide an enhanced connection between SR 303L and US 60.

Access Management

The access management policy for the improved SR 303L would not allow access except at service traffic interchanges generally spaced 1 mile apart at the major crossroads. As additional R/W would be acquired for the proposed improvements, all access points—other than the intersections with the major crossroads (see Table 3-5, on page 41)—would be closed. Parcels adjacent to SR 303L would

have access from the west-to-east arterial cross streets and not from SR 303L. If the improvements were fully implemented, no additional access points would be likely to be implemented. Any changes to the freeway access points would have to be approved by ADOT and would need to meet applicable design standards.

Consolidation of Drainage Infrastructure

The proposed project's associated outfall channel and series of detention basins would collect regional and roadway drainage from west of SR 303L. This system would protect the roadway from stormwater flows and would be a part of the overall flood control system for the area east of the White Tank Mountains. Collecting drainage along the west side of SR 303L would reduce the need for cross-drainage pipes or culverts under SR 303L and provide capacity for flows resulting from 100-year storms. The final outfall is to the Gila River, approximately 5 miles south of I-10. FCDMC designed this off-site drainage system concept as part of the *Loop 303 Corridor/White Tanks Area Drainage Master Plan*. FCDMC is a financial partner in the construction of this drainage system between I-10 and US 60, and is currently updating drainage concepts from the Gila River to I-10.

Implementation of the proposed SR 303L improvements and of FCDMC's drainage plans would benefit land located west of SR 303L by providing a drainage system with a more direct outfall to the south, to the Gila River. Reduction—or, in some cases, elimination—of off-site flows onto land located east of SR 303L would simplify and reduce costs of drainage systems on that side of the proposed improvements.

3. Description of the Preferred Alternative

The following sections describe the interim and ultimate configurations of SR 303L and the construction phasing under the Preferred Alternative. They also describe the traffic interchanges that would be built along SR 303L and R/W needs along the corridor.

Interim and Ultimate Freeway Configurations

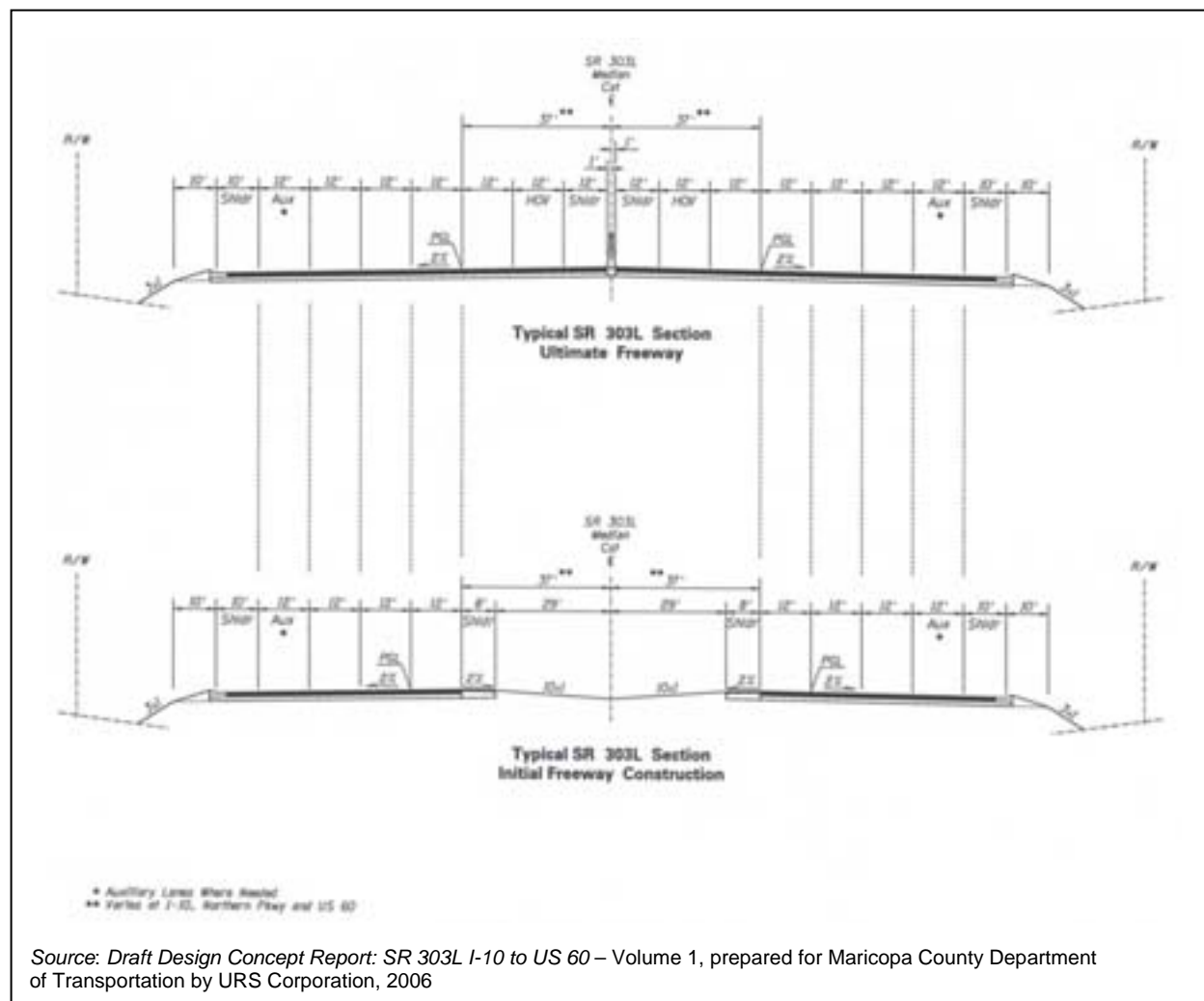
Under the Preferred Alternative, the interim SR 303L freeway would have three general purpose lanes in each direction. The ultimate freeway would have four general purpose lanes and one HOV lane in each direction (see Figure 3-1, on page 38). Consideration of how best to construct the ultimate configuration of SR 303L over time and with uncertain funding availability would need to balance the following considerations:

- cost minimization (for both interim and ultimate conditions)
- constructability
- ease of conversion to the ultimate freeway
- minimization of throwaway of existing facilities while converting to the ultimate freeway condition
- safety
- traffic capacity
- ability to accommodate free-flow traffic in the interim condition

The majority of the new construction for the interim freeway would be integrated into the ultimate freeway, thereby reducing the cost of constructing the ultimate freeway. Any pavement intended for only temporary purposes would be asphalt, while ultimate condition pavement would be Portland cement concrete overlaid with rubberized asphalt.

Irrigation channels, tailwater ponds, and other irrigation facilities that conflict with the interim roadway or with drainage improvements would be relocated to their ultimate locations to avoid their having to be moved a second time when the ultimate freeway would be constructed.

Figure 3-1. SR 303L typical sections (ultimate and interim configuration)



Construction Phasing

If the Preferred Alternative were selected, the preliminary plan would be to construct the proposed improvements to SR 303L in increments linked to funding availability. The drainage system would need to be developed further in coordination with FCDMC, including drainage basins and interim outfalls as necessary for segmented construction. All freeway construction would be concurrent with construction of the appropriate interim and final drainage facilities. Initial construction on the corridor would be the northern half of the I-10 system traffic interchange, including the realignment of I-10.

Traffic Interchanges

Service Traffic Interchanges

The local jurisdictions (Cities of Goodyear, Glendale, and Surprise) prefer SR 303L to be elevated over or depressed under the cross streets. These configurations would typically provide the greatest access along the cross streets.

Engineering and planning decisions regarding the merits of different vertical profile options at each cross street were evaluated using four categories: R/W, structures, earthwork, and total cost. The following discussion summarizes these considerations:

- **R/W** – Less crossroad R/W would be needed to take the freeway over the cross streets than the cross streets over the freeway (approximately 2 acres per interchange). In general, the decrease in the acreage is attributable to eliminating the need for additional R/W along the cross streets, which would be necessary to build embankments to elevate the crossroad. Local jurisdictions prefer this option because of the increase in developable land along crossroads adjacent to the service traffic interchanges.
- **Structures** – The cost of a structure to take the freeway over a cross street compared with taking a street over the freeway is generally \$600,000–\$800,000 more per location (2006 dollars). The actual cost would vary with the width needed for a given street. This comparison was based on the ultimate, ten-lane configuration of SR 303L. However, if the cross street were kept at-grade with the freeway passing overhead, the structure needed for the cross street to pass over the drainage channel would be much shorter. As a result, the cost would be reduced by approximately \$500,000–\$700,000 per location. The net result would be little difference in total structure costs for freeway-over versus street-over.
- **Earthwork** – In general, elevating SR 303L over at-grade cross streets would result in approximately 20 percent less earthwork than if the streets were elevated over the freeway.
- **Total cost** – The proposed plan to elevate SR 303L over Camelback Road (MP 7.0), Bethany Home Road, Glendale Avenue (MP 9.0), Peoria Avenue (MP 12.0), Cactus Road, and Waddell Road is estimated to save several hundred thousand dollars per location in combined earthwork, structures, and R/W costs. In addition, maintenance of traffic on the crossroads during construction would be simplified if the Preferred Alternative were selected. With the proposed plan, the cross streets would remain at-grade and open to traffic (except for some short-term closures) during construction. According to the DCR, the proposed plan at Northern Avenue to take SR 303L over Northern Avenue is estimated to cost more than projected for taking Northern Avenue over SR 303L. The additional cost is largely attributable to the effect that

implementation of the proposed plan would have on the system traffic interchange with the proposed Northern Parkway.

Currently, 16 cross streets intersect SR 303L or Cotton Lane from Van Buren Street (MP 3.0) to US 60 at 1-mile spacing. Each of these cross streets would require grade separations or traffic interchanges with SR 303L, with the exception of Clearview and Mountain View boulevards, which are already grade-separated and are not foreseen to become traffic interchanges. The remaining 14 cross streets that would require modifications and the addition of grade separation or traffic interchange structures are Van Buren Street, McDowell Road, Thomas Road, Indian School Road, Camelback Road, Bethany Home Road, Glendale Avenue, Northern Avenue, Olive Avenue, Peoria Avenue, Cactus Road, Waddell Road, Greenway Road, and Bell Road.

The evaluation of a tight-diamond traffic interchange versus a single-point urban interchange (SPUI) for the arterial cross streets would be made during the final design process. For the purpose of this Draft EA, the tight-diamond traffic interchange configuration is analyzed because it typically occupies a greater footprint than the SPUI, thereby offering a conservative analysis of potential impacts.

In general, SR 303L would be elevated over existing cross streets (see Table 3-5, on page 41) and return to near ground level between cross streets. This configuration is proposed from south of Indian School Road to north of Waddell Road. The freeway would be fully depressed at I-10 and McDowell Road and partially depressed at Thomas Road. The roadway would be elevated over the Roosevelt Irrigation District (RID) canal and Van Buren Street (where Van Buren Street would still intersect with Cotton Lane at grade). Going northward from Waddell Road, the freeway would be partially depressed at Greenway Road, fully depressed at Bell Road, and partially depressed to just south of US 60. The freeway would then rise to go over US 60 and the Burlington Northern Santa Fe (BNSF) Railroad tracks, using the existing bridge for southbound traffic.

Table 3-5. SR 303L configuration at cross streets

Location	Cross street profile at SR 303L^a	SR 303L profile at cross street	Interchange type^b
Van Buren Street	At grade (with Cotton Lane)	Elevated	Split diamond with Thomas Road
McDowell Road	At-grade (with Cotton Lane)	Depressed	Grade separation only with interchange frontage roads
Thomas Road	Partially elevated	Partially depressed	Split diamond with Van Buren Street
Indian School Road	At grade	Elevated	Tight diamond
Camelback Road	At grade	Elevated	Tight diamond
Bethany Home Road	At grade	Elevated	Tight diamond
Glendale Avenue	At grade	Elevated	Tight diamond
Northern Avenue	At grade	Elevated	Split diamond with Peoria Avenue
Olive Avenue and BNSF ^c tracks	At grade	Elevated	Grade separation only
Peoria Avenue	At grade	Elevated	Split diamond with Northern Avenue
Cactus Road	At grade	Elevated	Tight diamond
Waddell Road	At grade	Elevated	Tight diamond
Greenway Road	Partially elevated	Partially depressed	Tight diamond
Bell Road	At grade	Depressed	Tight diamond
Clearview Boulevard ^{d, e}	Elevated	Depressed	Grade separation only
Mountain View Boulevard ^e	Elevated	Depressed	Grade separation only
US 60 ^f (Grand Avenue)	At grade	Elevated	Depressed SPUI ^g

^a State Route 303 Loop^b Interchange types are tentative; actual type would be determined during the final design process.^c Burlington Northern Santa Fe Railroad^d approximate Union Hills Drive section line^e structure exists now^f United States Route 60^g single-point urban interchange

With the exception of the US 60 traffic interchange, service traffic interchanges would have one-lane off ramps that widen to three lanes as they approach the cross streets. The three lanes would consist of a left-turn lane, a middle lane, and a right-turn lane. The middle lane would be designated as a left-turn or right-turn lane for each location based on traffic estimates at the time of the final design process. The on-ramps would have two lanes that taper to one lane near the gore.

Cross streets would be reconstructed to the 300-foot control-of-access limits. They would be constructed to their ultimate width as shown in current approved transportation plans of the local jurisdictions.

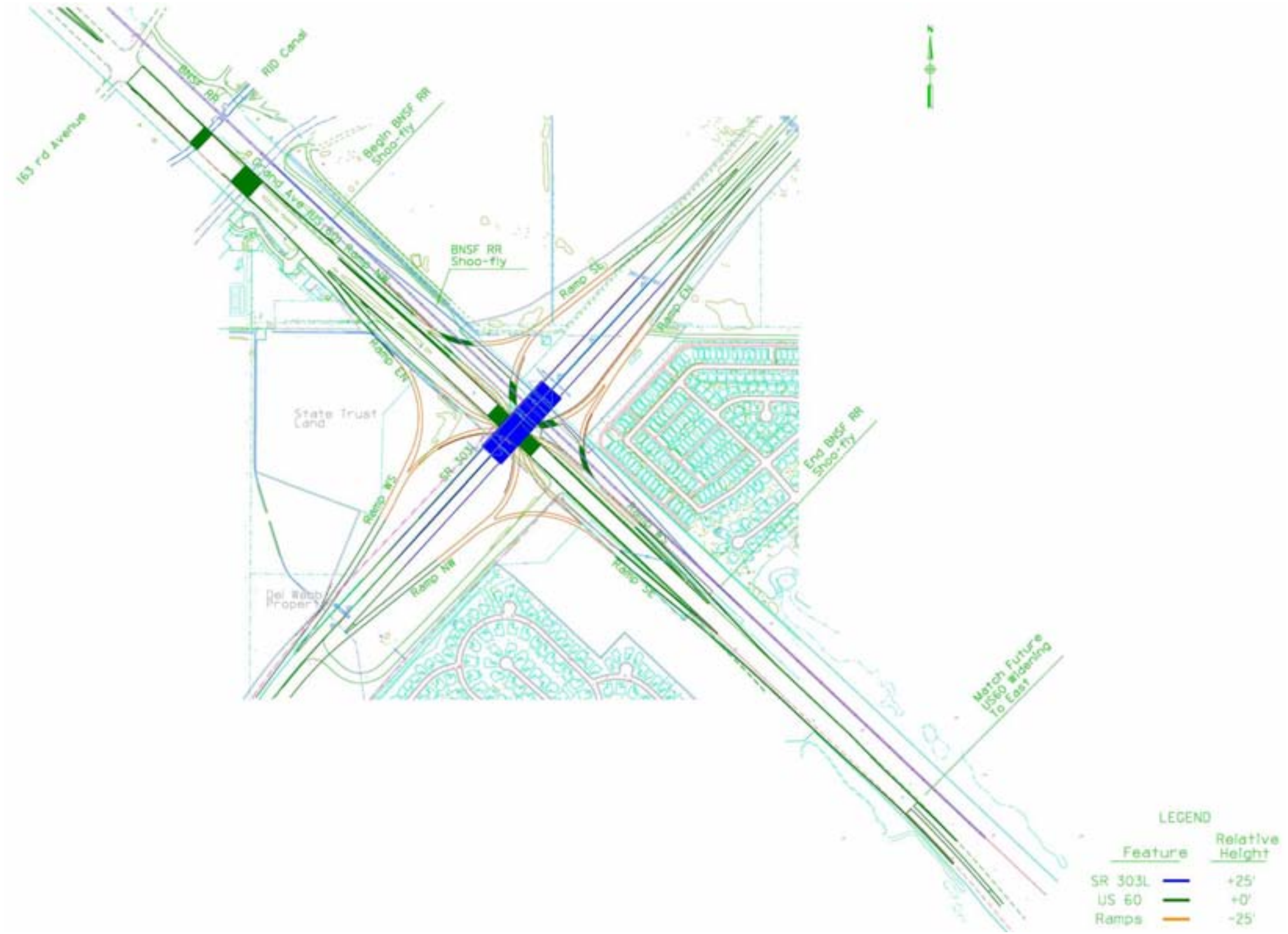
Service Traffic Interchange at US 60

US 60 (Grand Avenue) is an existing ADOT urban arterial street, but is planned to become an “enhanced arterial/limited expressway.” At SR 303L and US 60, a three-level service traffic interchange using a depressed SPUI would be constructed. A preliminary engineering analysis as part of the DCR showed that this configuration would provide the greatest benefits for safety and for efficient traffic operation.

This configuration would feature SR 303L one level up as it exists today, crossing over US 60 and BNSF. Ramps on the north side of US 60 would be constructed to pass under the railroad tracks because at-grade ramp crossings of the BNSF tracks are not allowed. US 60 would remain at-grade, on a structure crossing over the SPUI ramp intersection (Figure 3-2, on page 43). All ramps would be depressed one level below grade, and would connect to US 60 approximately 2,000 feet from the signalized ramp intersection. The depressed ramps would prohibit any access to US 60 within the limits of the ramps, resulting in the need for total takes of parcels located along US 60. The length of the ramps would also require the widening and reconstruction of US 60 from the 163rd Avenue intersection to a point approximately 3,500 feet east of the centerline of SR 303L, which would match into the widening project currently under design for US 60. A two-phase traffic signal would control the intersection of the northbound-to-westbound, southbound-to-eastbound, westbound-to-southbound, and eastbound-to-northbound ramp movements. All right-turn movements would be on free-flow ramps, spread more than on traditional SPUIs because of the vertical differential between crossroad and ramp (which does not occur on the traditional SPUI).

This configuration would minimize the facility’s height above ground and the resultant visual and noise level impacts for nearby neighborhoods. The interchange would need traffic signals at the depressed ramp intersections and a pump station for drainage that would discharge into the proposed drainage basins located southwest of the interchange. Ramp geometry and signal placement would be designed to optimize traffic signal visibility. The interchange would have moderate-to-high construction costs, and would need moderate amounts of R/W (including approximately 1 acre of permanent R/W from BNSF for US 60 and ramp widenings, and an access permit from BNSF for approximately 1.2 acres for maintenance of railroad bridges over the ramps and the SR 303L bridges over the railroad) when compared with other alternatives considered.

Figure 3-2. SR 303L/US 60 service traffic interchange (Preferred Alternative)



Any future design modifications to the proposed service traffic interchange at SR 303L and US 60 would require a reevaluation of the environmental document.

The existing connection between SR 303L and US 60 is provided by a two-way, “jug-handle” access road in the southeast quadrant of the SR 303L/US 60 interchange, and includes a signalized intersection both at US 60 and at SR 303L. This access road would be removed as part of the proposed interchange improvements. The depressed SPUI would relocate traffic away from existing homes in the southeast quadrant and would improve the traffic operations between SR 303L and US 60.

To construct the structures to take the ramps under the railroad, a proposed shoo-fly to the north of the existing rail alignment would be constructed. A shoo-fly is a temporary stretch of track that detours trains around construction zones. This shoo-fly would allow construction of a portion of the railroad bridges, replacement of the main track on its original alignment, and then completion of the remaining structures. The layout of the shoo-fly has the concurrence of BNSF and the geometry is such that it accommodates the BNSF Phoenix Subdivision speed of 49 mph. BNSF would be afforded the opportunity to comment during final design. The realignment of the BNSF railroad would result in temporarily moving the tracks closer to the existing neighborhood at the northeast corner of the interchange by approximately 25 to 50 feet. Noise impacts from the railroad are not expected to increase significantly because there are no at-grade crossings contained within the shoo-fly and, therefore, no need for trains to sound their whistles nor severely accelerate or decelerate within the shoo-fly area.

The construction of the platform bridges for the depressed SPUI ramps would require traffic restrictions on US 60. Closures would be limited to a single direction at one time, and traffic would be diverted to the opposing roadway using appropriate traffic control. Following construction of the platform bridges, US 60 would likely be completely closed for approximately 1 day to allow for post-tensioning the structures.

Several alternatives to the above-described SR 303L/US 60 service traffic interchange configuration were considered. A partial cloverleaf design was rejected because of unacceptable LOS of the US 60 intersection, the undesirable loop off ramp, and the need for long ramps for acceleration and deceleration. In addition, such a configuration would increase noise impacts to adjacent neighborhoods and would require steep grades for ramps. A platform diamond design would have poor sight distances, would create moderate impacts on noise levels, and would need the greatest amount of BNSF R/W. A semidirectional design would need the greatest amount of R/W and would have highly visible elevated flyover ramps that would create visual and noise level impacts.

System Traffic Interchanges

System traffic interchanges would be constructed at I-10 and at the proposed Northern Parkway.

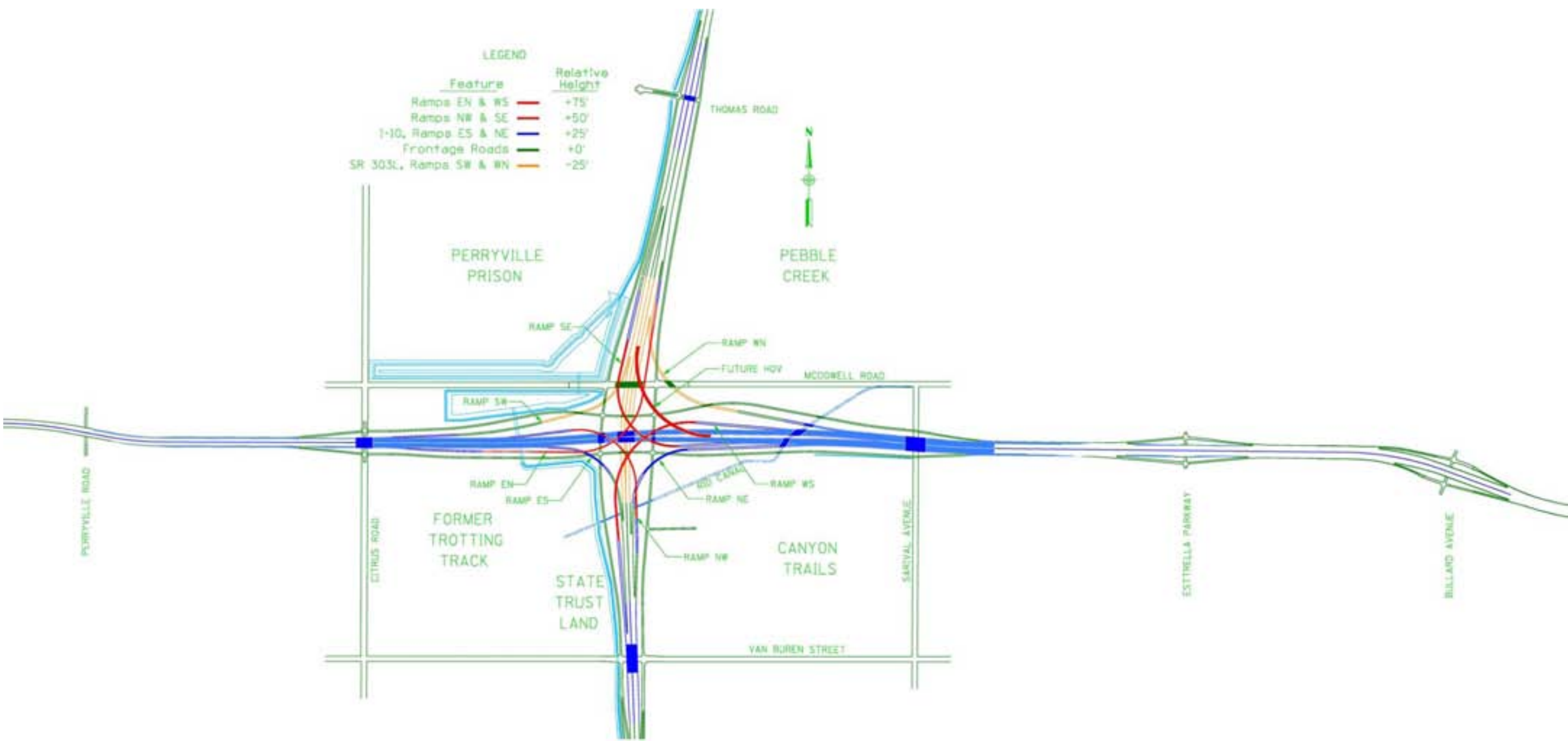
The recommended configuration for the SR 303L/I-10 system interchange is a five-level directional interchange (Figure 3-3, on page 47). I-10 would be elevated one level and would be realigned 250 feet to the north to minimize impacts on adjacent residential development in the southeast quadrant of the interchange and to accommodate maintenance of traffic on I-10 during reconstruction of I-10. SR 303L would be depressed one level below grade at McDowell Road and at I-10, would rise over the RID Canal to the south of I-10, and would be one level above grade at Van Buren Street.

Half-diamond interchanges would be added on I-10 at Citrus Road, west of the system interchange, and at Sarival Avenue, east of the interchange. These half-diamond interchanges would be connected by two-lane, one-way frontage roads, which would remain at ground level. Local access would be allowed onto and off of these frontage roads using right-in, right-out configurations. This split diamond interchange configuration would replace the existing I-10/Cotton Lane interchange.

Along SR 303L, half-diamond interchanges would be constructed at Van Buren Street and at Thomas Road and would be connected by two-lane, one-way frontage roads, which would remain at grade. These frontage roads would connect with the I-10 frontage roads and with McDowell Road to provide local circulation and access to existing and future development north and south of I-10.

Directional ramps for southbound-to-westbound and westbound-to-northbound traffic would be depressed one level under McDowell Road and connect into I-10 one level above ground. Ramps for northbound-to-westbound and southbound-to-eastbound traffic would cross over I-10 and be elevated two levels above ground (approximately 50 feet) at I-10. Ramps for eastbound-to-northbound and westbound-to-southbound traffic would be elevated three levels above ground (approximately 75 feet), crossing over the ramps for northbound-to-westbound and southbound-to-eastbound traffic. Both I-10 and SR 303L would have widened medians to accommodate future HOV connectors for the southbound-to-eastbound and westbound-to-northbound traffic movements. The HOV ramp would be elevated one level over McDowell Road and two levels over I-10. Directional ramps between SR 303L and I-10 would require additional width on I-10. The additional width would be reduced to match the ultimate I-10 roadway width at Perryville Road on the west and Bullard Avenue on the east.

Figure 3-3. SR 303L/I-10 system traffic interchange (Preferred Alternative)



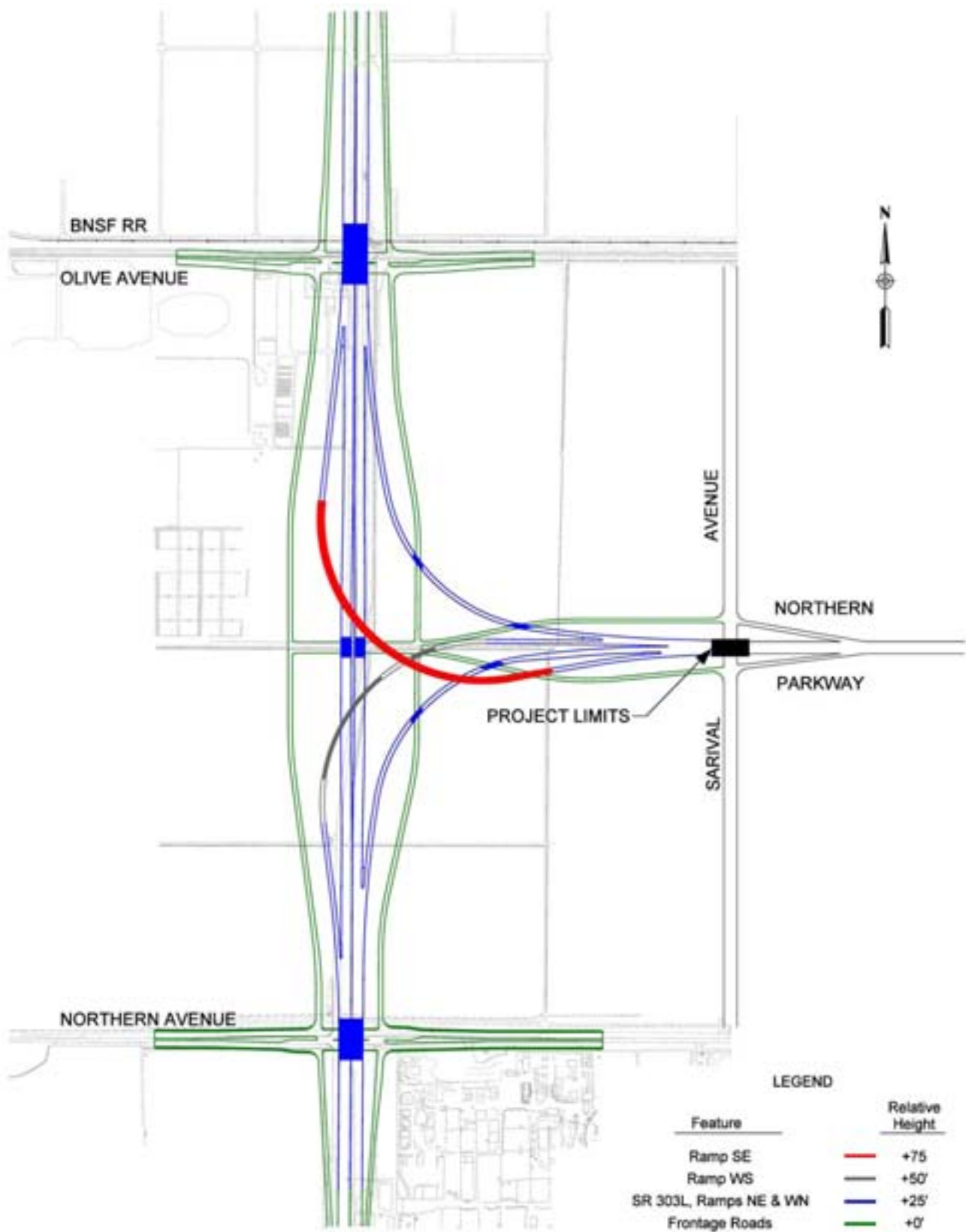
The proposed Northern Parkway, expected to be a major thoroughfare serving the West Valley, is projected to carry over 80,000 vpd. Therefore, the preferred SR 303L and Northern Parkway interchange would have to handle heavy traffic to and from this parkway. According to analyses accompanying the DCR for SR 303L, I-10 to US 60, a T-shaped system traffic interchange with frontage roads would be constructed at the proposed Northern Parkway (Figure 3-4, on page 50). This three-level traffic interchange would have fully directional ramps to support all traffic movement at the Northern Parkway mid-mile alignment with SR 303L between Northern and Olive avenues.

A half-diamond interchange would be constructed at Northern Avenue to provide SR 303L access to and from the south. Northbound and southbound one-way frontage roads would extend from Northern Avenue to Peoria Avenue. No ramps would be provided at Olive Avenue because of operational conflicts with the system traffic interchange and ramp crossings of the BNSF tracks. Northern Parkway would approach SR 303L from the east, being elevated over Sarival Avenue. Eastbound and westbound one-way, two-lane frontage roads would extend from the northbound and southbound frontage roads to Sarival Avenue and align with the Northern Parkway's Sarival Avenue ramps to east of Sarival Avenue.

The frontage roads would generally be at-grade. SR 303L and Northern Parkway would be elevated one level aboveground, as would directional ramps for traffic heading north on SR 303L from westbound Northern Parkway and traffic heading east on the parkway from northbound SR 303L. A directional ramp for traffic heading south on SR 303L from westbound Northern Parkway would be elevated two levels above ground. Traffic heading east on the parkway from southbound SR 303L would be elevated three levels aboveground on a directional ramp.

The City of Surprise is considering plans to construct a major north-south arterial street west of SR 303L from Northern Avenue or Olive Avenue to Bell Road. Extension of the proposed Northern Parkway westward to link into this new arterial street may have merit. If the proposed Northern Parkway were to be extended west of SR 303L, the T-shaped system traffic interchange would need modification; this issue would be addressed during a subsequent design stage. In the interim, such connectivity would be provided by the east-west frontage roads discussed above. Preliminary configurations of the interchange have been designed to allow for future expansion to the west through the frontage road connections, and final designs would allow for this connection with little or no reconstruction of the system interchange required.

Figure 3-4. SR 303L/Northern Parkway system traffic interchange (Preferred Alternative)



Right-of-way

This section describes the existing and proposed R/W along the SR 303L corridor. Additional discussion of R/W needs is contained in the *Economic Conditions* and *Utilities* sections of Part 4, beginning on pages 157 and 175, respectively.

Description of Existing Right-of-way

ADOT previously purchased, or received by dedication, a portion of the R/W for the SR 303L corridor in the early 1990s. MCDOT has purchased some additional R/W along the corridor. Some of the ultimate R/W for the freeway exists from McDowell Road north to US 60. The R/W is generally 300 feet wide and widens to 600 feet or more at the future service traffic interchange locations.

Most of the SR 303L R/W was dedicated to ADOT by the adjacent property owners in exchange for construction of the interim roadway in 1992 and a commitment to begin construction of a freeway by 2005. The dedicated parcels contain a reversion clause stating that any portion of the dedicated R/W not used by ADOT for the interim roadway will be returned to the grantor “if ADOT (a) should abandon its plan to construct the SR 303L Freeway before December 31, 2005, or (b) should fail to commence construction of the SR 303L Freeway by December 31, 2005.” The reversion clause was determined to be valid and the reversion terms were met. The amount of land that will revert to the original owner is under debate at this time.

Summary of Proposed Right-of-way and Easement Requirements

The existing R/W is not sufficient to accommodate the entire ultimate freeway and off-site drainage system that would be needed for the proposed project. The typical cross section is wider than envisioned in 1990 and the drainage system is much wider. As a result, additional R/W would be needed along most of the corridor south of Greenway Road.

Significant amounts of R/W would be needed to accommodate the traffic interchanges at I-10, Northern Parkway, and US 60. Additional R/W would be required adjacent to US 60 because of “land-locked” properties that would no longer have safe access from the adjacent roadways. In the southern quadrant of the proposed interchange at US 60, the vacant land is owned by Grand Avenue and Estrella Freeway Property LP. The land situated in the western quadrant of the proposed US 60 interchange has a number of landowners, including ASLD. Two businesses operate from part of this area: A Adobe RV & Mini Storage and Sav-on-Fence, a small fencing contractor.

At Northern Parkway, additional R/W is required to construct the frontage roads between Northern and Olive avenues and the ramps connecting into the proposed “super street.”

Between Northern Avenue and Camelback Road, Adaman Irrigation and Water Delivery District has a 45-foot-wide R/W adjacent to the existing SR 303L R/W for its distribution pipes. The distribution pipes would have to be relocated to the east side of the future SR 303L R/W and replacement R/W provided for the district.

Substantial R/W would be required at the I-10 and SR 303L interchange. The additional R/W would allow for the construction of the directional ramps and one-way frontage roads that would run parallel on either side of I-10 and SR 303L and for the realignment of I-10 to accommodate the interchange without infringing on existing neighborhoods south of I-10. Additional R/W would also be needed to accommodate the proposed widening of I-10 between Perryville Road and Bullard Avenue. R/W needs have increased from those outlined in the 2002 initial DCR because the plans now include the off-site drainage basins and channels as defined through the *Loop 303 Corridor/White Tanks Area Drainage Master Plan Update* being prepared for FCDMC. This off-site drainage system is based on FCDMC regional drainage requirements instead of ADOT criteria so that it is larger and requires more R/W. In addition, the proposed R/W is now based on the ultimate section for the freeway of four lanes in each direction plus an HOV lane and auxiliary lanes between interchanges.

The R/W needed along the SR 303L corridor is shown in Figures 3-5 and 3-6, on pages 53 and 54, respectively. Figure 3-7, on page 55, shows the R/W needed at the SR 303L/I-10 system traffic interchange. Figure 3-8, on page 57, shows the R/W required at the SR 303L/Northern Parkway system traffic interchange. Figure 3-9, on page 59, shows the R/W needed at the SR 303L/US 60 service traffic interchange.

The parcels that have not been dedicated that are located inside the proposed R/W boundary would need to be acquired or dedicated. A R/W acquisition program would be implemented by ADOT’s Right-of-Way Group in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), the Uniform Relocation Act Amendments of 1987 (Public Law 100-17), and Title VI of the Civil Rights Act of 1964. Private property owners would be compensated at fair market value for land to be acquired for project R/W.

Figure 3-5. Proposed new right-of-way along SR 303L corridor (southern half)

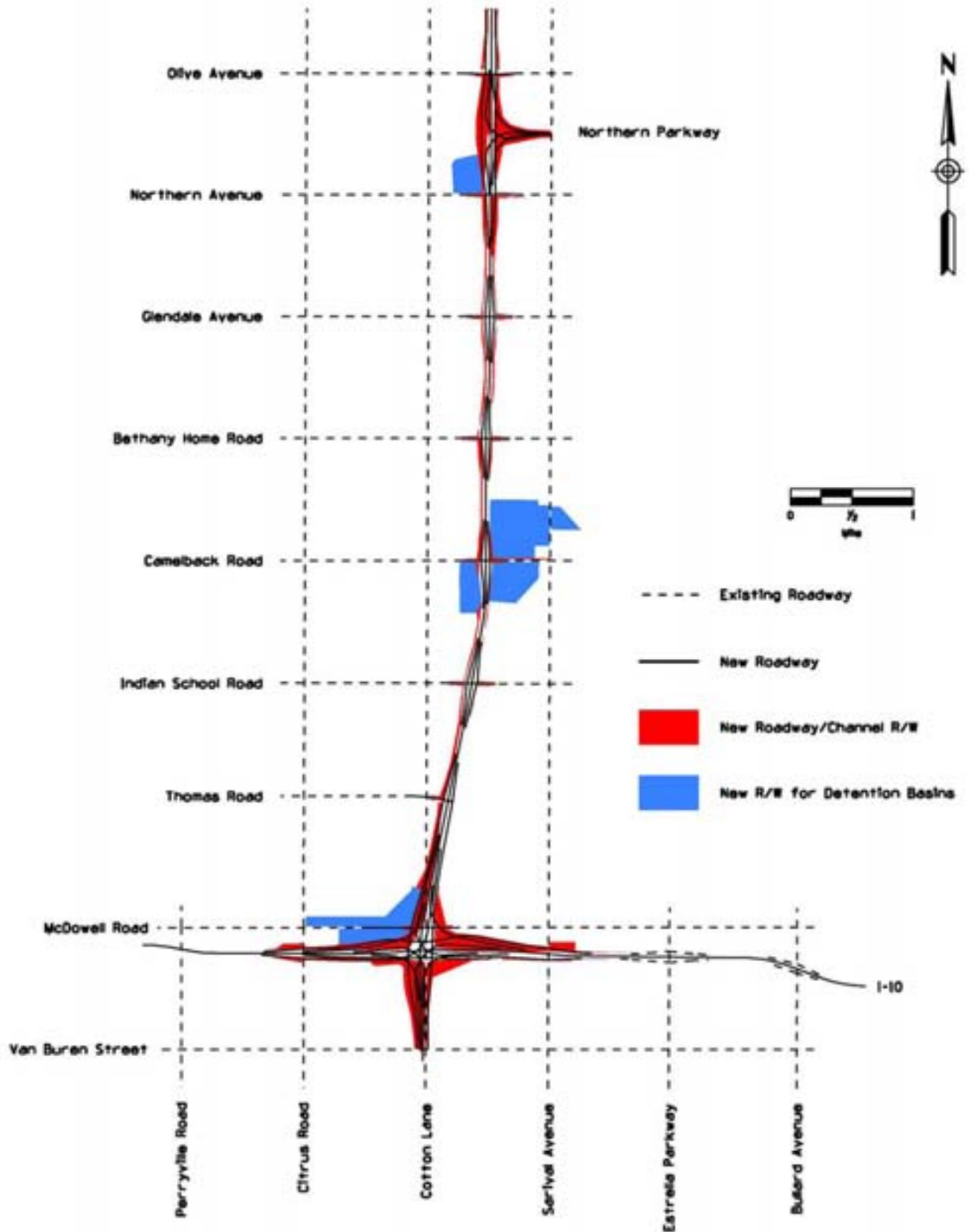


Figure 3-6. Proposed new right-of-way along SR 303L corridor (northern half)

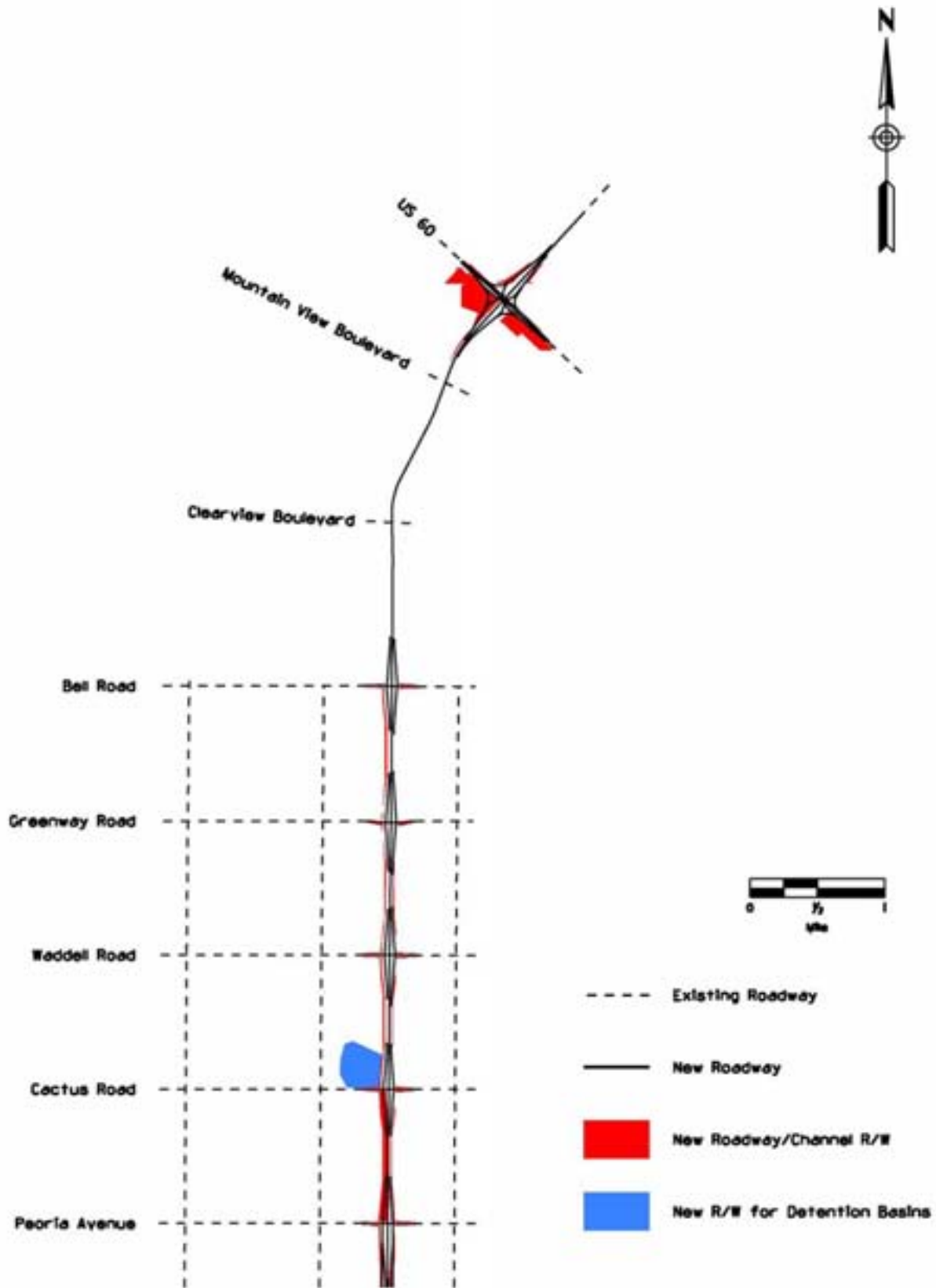


Figure 3-7. Proposed new right-of-way at SR 303L/I-10 system traffic interchange

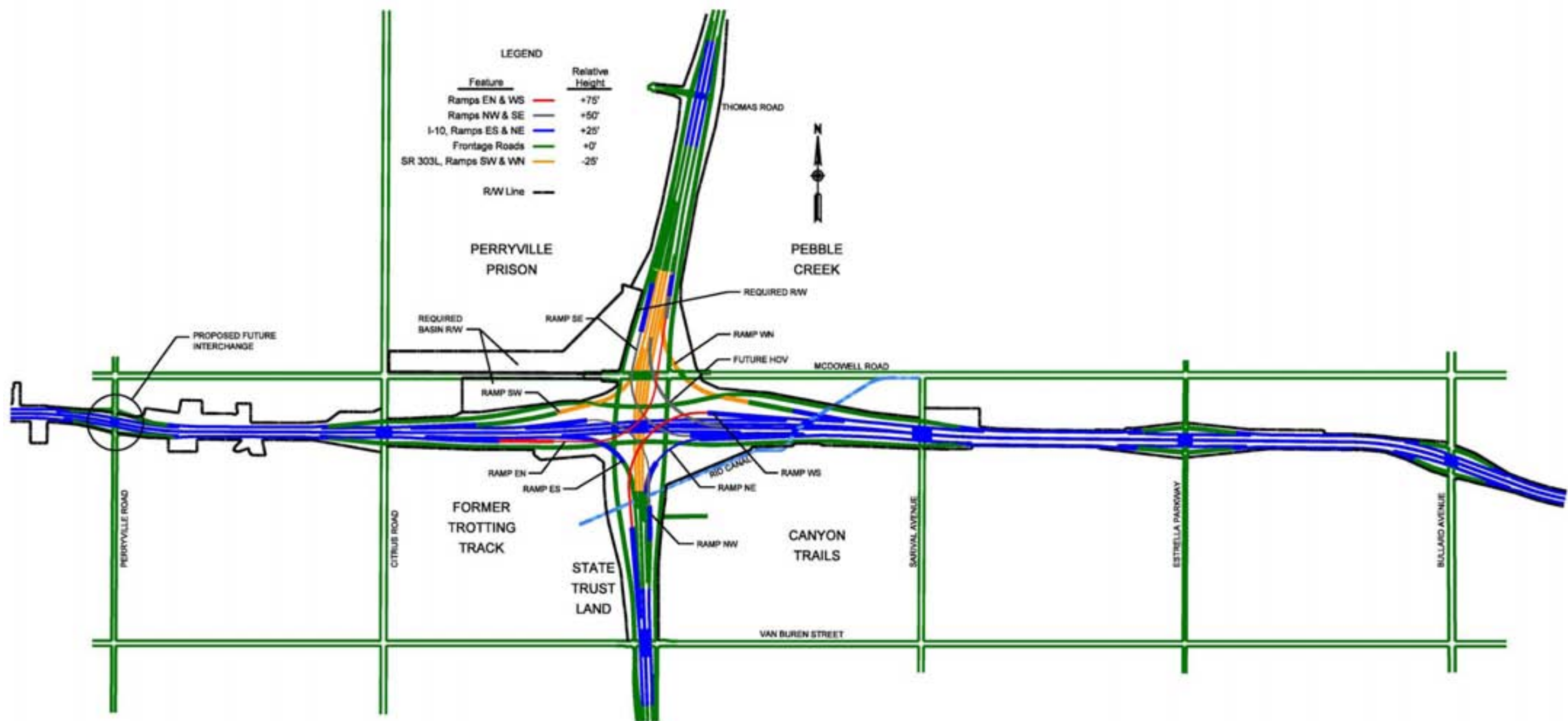
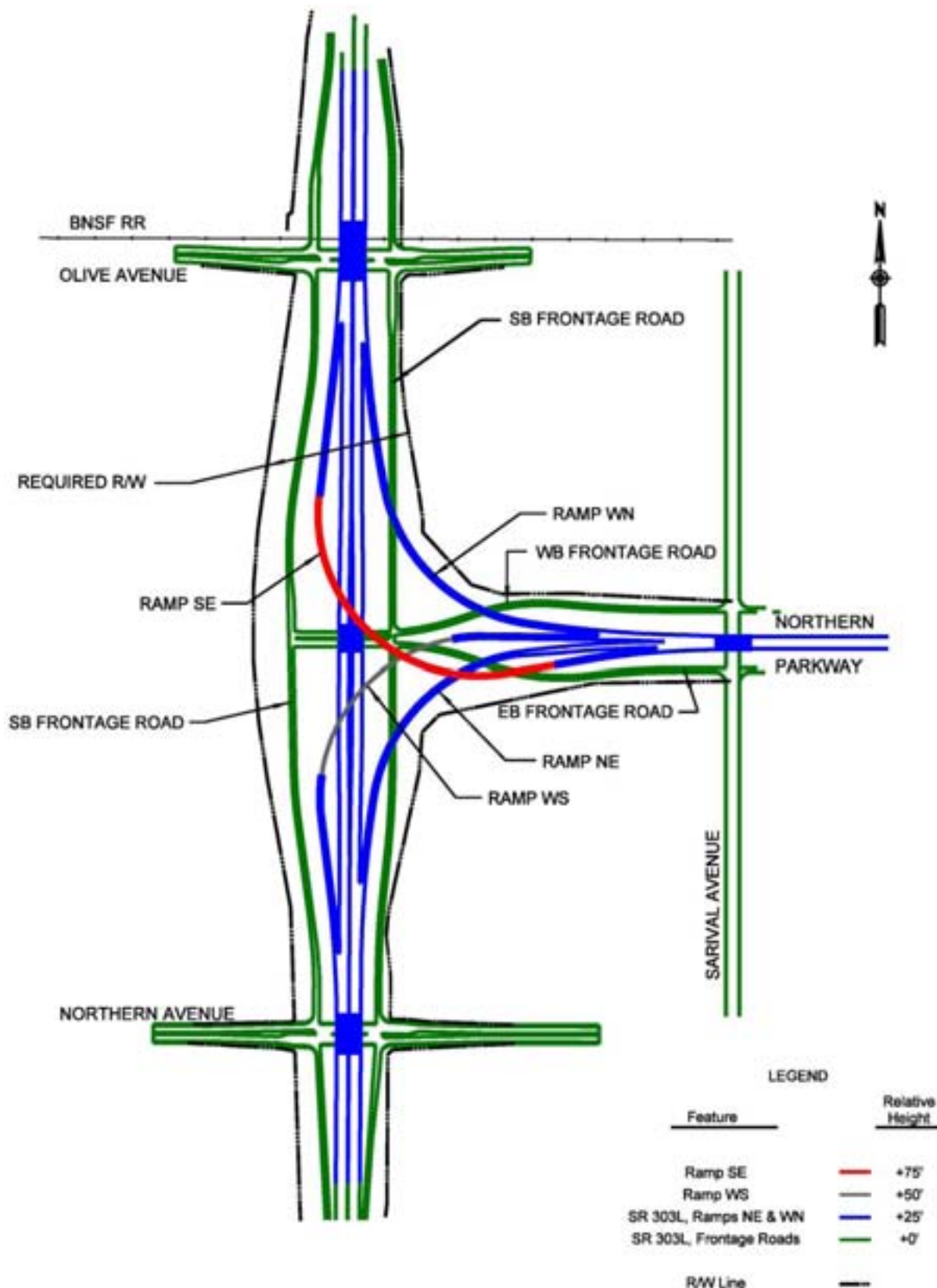
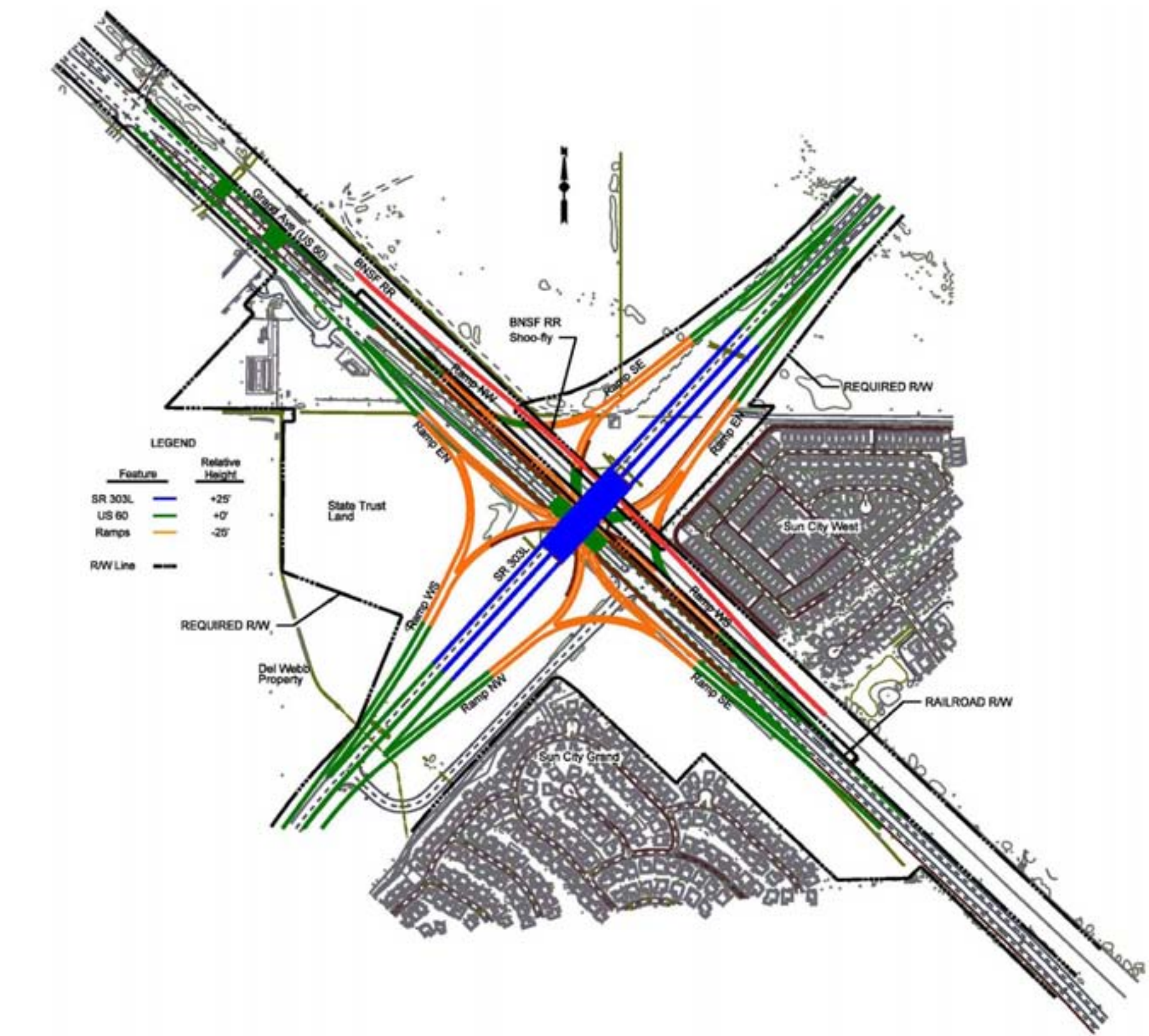


Figure 3-8. Proposed new right-of-way at SR 303L/Northern Parkway system traffic interchange



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Figure 3-9. Proposed new right-of-way at the SR 303L/US 60 service traffic interchange



C. Conclusion

Through the alternative development process, a Preferred Alternative for the SR 303L improvements emerged. It consists of upgrading SR 303L to a freeway facility with an ultimate configuration of ten lanes. Two system traffic interchanges would be built, at the intersection of SR 303L and I-10 and the proposed Northern Parkway. Additionally, 14 service traffic interchanges would be built to connect SR 303L to cross streets. A three-level service traffic interchange in a SPUI configuration would provide an enhanced connection between SR 303L and US 60. The environmental impacts of the Preferred Alternative and the No-Build Alternative are evaluated in Part 4, *Affected Environment and Environmental Consequences*, on page 62.

Part 4. Affected Environment and Environmental Consequences

This part of the Draft EA describes the Study Area environment, the environmental impacts associated with the Preferred and No-Build Alternatives, and potential mitigation measures.

The following resources or issues are either not present in or not relevant to the Study Area and, therefore, are not discussed in this Draft EA: wild and scenic rivers, wilderness areas, wetlands, and sole-source aquifer. Prior studies prepared for the SR 303L corridor (see Part 2, *Project Purpose and Need*, on page 10), along with general regional environmental data, provided the basis for this determination.

A. Land Ownership, Jurisdiction, and Land Use

Land within the Study Area consists of public and private land under the jurisdiction of the Cities of Goodyear, Glendale, and Surprise. Some land is within unincorporated Maricopa County, while some is State Trust land.

1. Existing Conditions

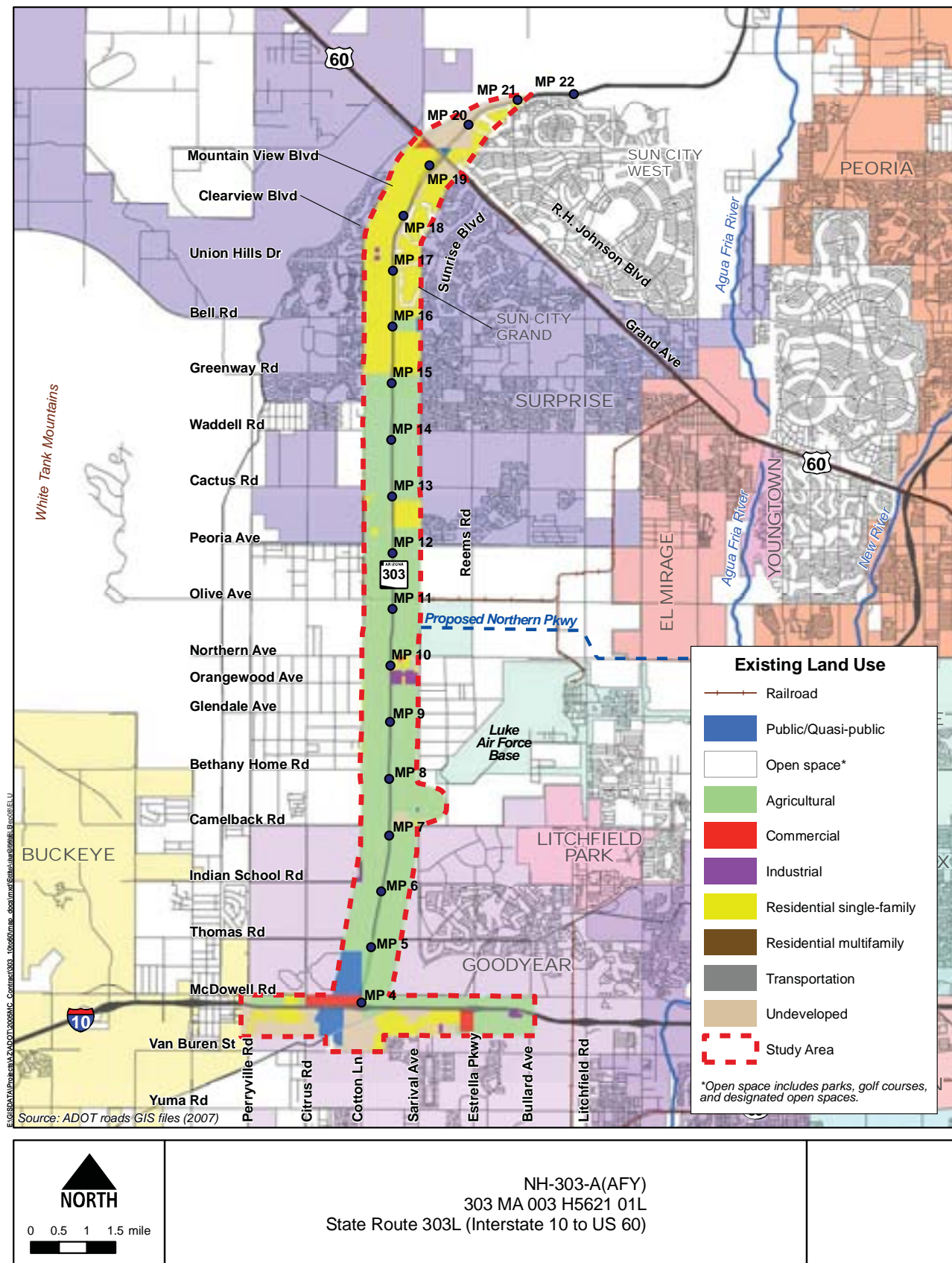
Existing Land Use

Existing land use in the Study Area consists of a combination of residential, commercial, industrial, agricultural, and other uses. The existing land use is presented in Table 4-1, on this page, and in Figure 4-1, on page 63.

Table 4-1. Existing land use

Land use	Acreage	Percentage of Study Area
Agricultural	7,227	55
Residential	3,053	23
Undeveloped	1,263	10
Transportation	576	4
Public/Quasi-public	401	3
Open space	301	2
Commercial	196	2
Industrial	121	1
Study Area total	13,138	100

Figure 4-1. Existing land use



Residential

Residential land uses include single-family homes in developments ranging from low- to high-density, with such development spread throughout the Study Area. Low-density development occurs south of I-10. The high-density development occurs at the northern end of the proposed project and along McDowell Road east of Cotton Lane. Existing developments in the Study Area include Sun City West, Sun City Grand, Bell West Ranch, Northwest Ranch, Surprise Farms, Prasada, Highland Estates, Wingate at Sycamore Farms, and Sierra Montana in Surprise; Clearwater Farms in unincorporated Maricopa County; and Pebble Creek, Canyon Trails Ranch, Cotton Flower, Quintana Estates, Canada Village, Palm Valley, and Sarival Gardens in Goodyear.

Commercial/Industrial

Commercial land uses within the Study Area are mostly located adjacent to SR 303L and I-10. Large commercial centers make up the majority of the commercial uses within the Study Area and include:

- Cotton Lane RV Park just south of I-10
- Goodyear Market Place Swap Meet north of I-10 and east of Citrus Road
- Goodyear Centerpoint north of I-10 and east of Pebble Creek Parkway
- Prado Kennel, White Tanks Storage, and Wildlife World Zoo off Northern Avenue
- Greenway Crossing shopping mall at SR 303L and Greenway Road
- Albertson's/Osco Drug at SR 303L and Bell Road in Surprise
- A Adobe RV & Mini Storage and Sav-on-Fence near SR 303L and US 60

Several light industrial operations have facilities within 0.5 mile of the Study Area (all are in Goodyear):

- Poore Brothers (potato chips)
- Snyder's of Hanover (snack foods)
- Palm Valley 303 Cross-Dock (distribution center)

Agricultural

Land within the 1-mile-wide corridor surrounding SR 303L includes approximately 7,200 acres of agricultural land. Several nursery/tree farm operations and feedlots are also in the area. Agricultural operations use groundwater supply wells and/or Central Arizona Project water. Irrigation deliveries are conveyed in privately owned earthen or concrete-lined canals by the Adaman Irrigation and Water Delivery District or the Maricopa County Municipal Water Conservation District.

Other Uses

Several other facilities are located in the Study Area, including the Arizona State Prison Complex-Perryville, Luke AFB, and an abandoned horse racetrack. The prison is located just west of SR 303L and north of I-10. Luke AFB is about 1 mile east of SR 303L, and base property, including the southern end of the runway, is within 1 mile of SR 303L. The abandoned racetrack is located south of I-10 and east of Cotton Lane. Public access to these facilities is restricted.

The City of Surprise Fire Station 303 is located at Greenway Road and Cotton Lane, 0.5 mile west of SR 303L.

Currently, four schools are located within the Study Area. Three schools are located in Surprise: Cimarron Springs Elementary School, E-Institute Charter High School, and Sonoran Heights Elementary School. Desert Thunder Elementary School is located in Goodyear and is part of the Avondale Elementary School District.

- Cimarron Springs Elementary School opened in 2004 and is located 0.25 mile north of Greenway Road, approximately 0.5 mile west of SR 303L.
- Desert Thunder Elementary School is located 0.3 mile east of Cotton Lane and 0.25 mile south of I-10.
- E-Institute Charter High School is located 0.33 mile east of SR 303L on Greenway Road.
- Sonoran Heights Elementary School is located 0.5 mile east of SR 303L and 0.33 mile south of Greenway Road.

Planned Land Use

Local governments exercise control over the development of land through planning, zoning, and subdivision ordinances as well as through long-range comprehensive plans. Future land use plans and specific proposed land use changes are generally found in the local governmental and regional planning documents. The following is a list of the comprehensive plans that contain more detailed information on future and planned land uses in the Study Area:

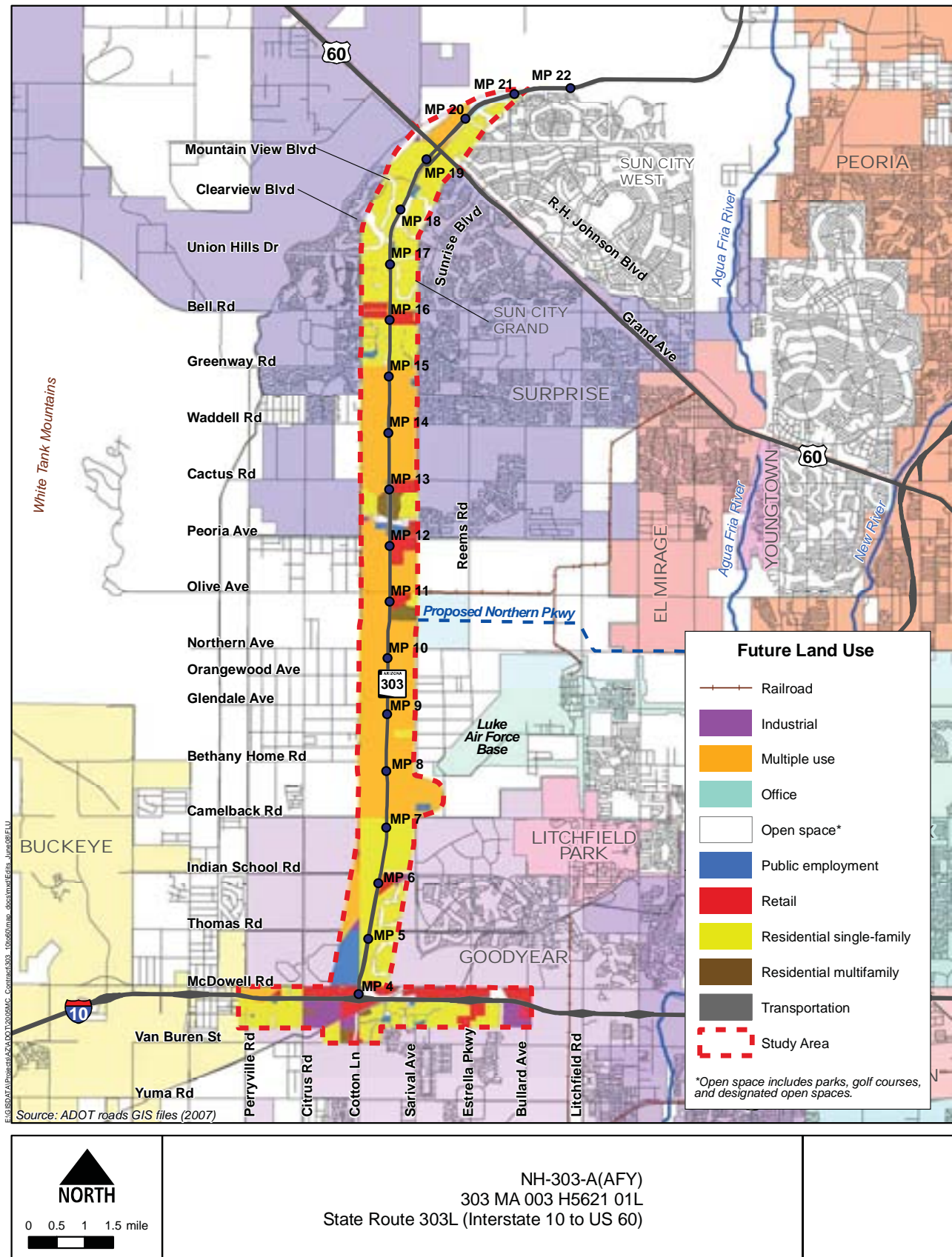
- City of Glendale's *Glendale 2025: The Next Step General Plan* (2002a) and *Transportation Plan* (2002b)
- City of Goodyear's *General Plan* (2003)
- City of Surprise's *General Plan 2020: Imagine the Possibilities* (amended in 2005)
- MAG's *Valley Vision 2025* (2000) and *Regional Transportation Plan* (2003)
- Maricopa County's *White Tanks/Grand Avenue Area Plan* (updated 2004); and *2020 Eye to the Future Comprehensive Plan* (updated in 2002)

These plans indicate that residential and urbanized development is expected to continue in the future for most of the area within and surrounding the Study Area (Figure 4-2, on page 67). These future land uses would convert farmland into residential and urban uses and would create a noticeable change in the character and physical condition of the surrounding land. The future land use acreage is presented in Table 4-2, on this page.

Table 4-2. Future land use

Land use	Acreage	Percentage of Study Area
Multiple use	4,905	37
Residential (single-family)	4,815	37
Retail/Commercial	1,122	9
Open space	940	7
Public employment	453	3
Industrial	379	3
Transportation	278	2
Residential (multifamily)	246	2
Study Area total	13,138	100

Figure 4-2. Future land use



Based on future land uses identified by the jurisdictions, the 7,200 acres of existing agricultural land use will be replaced with other land uses within the 1-mile-wide Study Area. Build-out can reasonably be assumed to occur by 2030. Examples of future land use include a Westcor regional shopping mall and auto mall at SR 303L and Cactus Road in Surprise. In Goodyear, planned developments are Canyon Trails Towne Center at Cotton Lane and Van Buren Street, Market at Estrella Falls at Pebble Creek Parkway and McDowell Road, and the Palm Valley Commercial Site at Estrella Parkway south of I-10.

The Study Team anticipates few future land use changes in the area west of and adjacent to Luke AFB. The Arizona Department of Commerce, Arizona State Legislature, and special interest groups initiated efforts to place much of the existing farmland within the Luke AFB noise contour and accident potential zone into a farmland preservation area to provide the necessary buffer for continued aircraft operations in the future. The general plans of the responsible jurisdictions reflect continued agricultural uses around Luke AFB. At some point in the future, when the transportation infrastructure can fully provide support, industrial and commercial uses will likely be developed. Such facilities would not be subject to the same noise constraints that housing developments would.

2. Environmental Consequences

Preferred Alternative

The Preferred Alternative is compatible with local and regional general plans and transportation plans. Implementation of the Preferred Alternative would adversely affect agricultural land use in the area. This land would be converted to other uses and be lost to agricultural purposes. However, much of this conversion would take place with or without selection of the Preferred Alternative.

The proposed project would require the acquisition of approximately 960 acres of new R/W, including approximately 800 acres of agricultural land, which would reduce the amount of farming in the area. This topic is discussed in more detail in Part 4, Section K, *Prime and Unique Farmland*, on page 141. The exact amount of R/W needed for the proposed improvements to SR 303L would be determined once the final design phase were completed.

Implementation of the Preferred Alternative would have minor impacts on other existing and/or planned land uses in the Study Area. No access changes would occur relative to the Arizona State Prison Complex-Perryville; therefore, no impacts would be expected on any aspect of the prison's operations. An outfall channel detention basin is proposed on prison property immediately north of I-10. The Arizona Department of Corrections has agreed to this use.

The proposed improvements to SR 303L would not encroach on Luke AFB property. No flight path obstruction issues would exist because any elevated freeway structures would be well below the minimum height required to accommodate minimum aircraft climb rates. Luke AFB and supporters of the base's mission and economic benefit to the county are concerned with secondary or cumulative impacts to the base; this topic is discussed in more detail in Part 4, Section Q, *Secondary Impacts* (on page 180), and Part 4, Section R, *Cumulative Impacts* (on page 183).

The drainage system being developed by FCDMC adjacent to SR 303L includes drainage channels and eight separate detention basins totaling approximately 607 acres (see the map in Appendix A, *Drainage Information*).

Local municipalities may consider the following measures to mitigate the Preferred Alternative and perhaps capitalize on the opportunities of the proposed improvements:

- Zoning changes – Changes in zoning for a parcel may be approved by a municipality to allow freeway-compatible land uses near a transportation corridor, ensuring that the best and most compatible development pattern can occur.
- Development codes for corridors – Municipalities may adopt codes or ordinances addressing specific requirements for development occurring within a transportation corridor.

No-Build Alternative

Future development in the Study Area is expected to continue, regardless of which alternative is selected. However, access throughout the area—under the No-Build Alternative—may be inadequate to support future land use projections, resulting in traffic congestion and increased air pollution. These problems would likely constrain development and economic progress. For example, commercial and industrial development under the noise contour constraints of Luke AFB will depend on higher-density transportation infrastructure being in place.

3. Mitigation Measures

The Preferred Alternative is compatible with local and regional general plans and transportation plans. No mitigation measures for land use are required.

4. Conclusion

The Preferred Alternative conforms to local and regional planning documents from various jurisdictions. Implementation of the Preferred Alternative would require acquisition of new R/W. Impacts on existing and future land uses would be minimized by maintaining access to adjacent

properties and accommodating traffic volumes associated with future land development in the Study Area. Access would remain as it is today: from crossroads only.

Under the No-Build Alternative, existing and future land uses would not be adversely affected by acquisition of R/W for the proposed transportation improvements. Selection of the No-Build Alternative would, however, mean more traffic congestion and increased air pollution, among other impacts such as constrained economic development. New transportation infrastructure would be needed to meet area municipalities' comprehensive plans. The lack of that infrastructure would hinder development and force increased traffic congestion onto nearby arterial streets and US 60. These roads are not designed to handle increased traffic at the levels that would be required to provide satisfactory LOS along these thoroughfares, nor have local municipalities budgeted funding to improve these roads to handle that level of increased traffic.

B. Water Resources

This section discusses water resources in the Study Area and how they may be affected by the proposed SR 303L project. The resources considered in this section include surface water, groundwater, irrigation districts, and groundwater wells infrastructure. The issue of subsidence, which is related to groundwater pumping, is also discussed.

Information regarding floodplains may be found in Part 4, Section C, *Floodplain Considerations* (on page 80), while information about jurisdictional waters may be found in Part 4, Section D, *Clean Water Act* (on page 83).

1. Existing Conditions

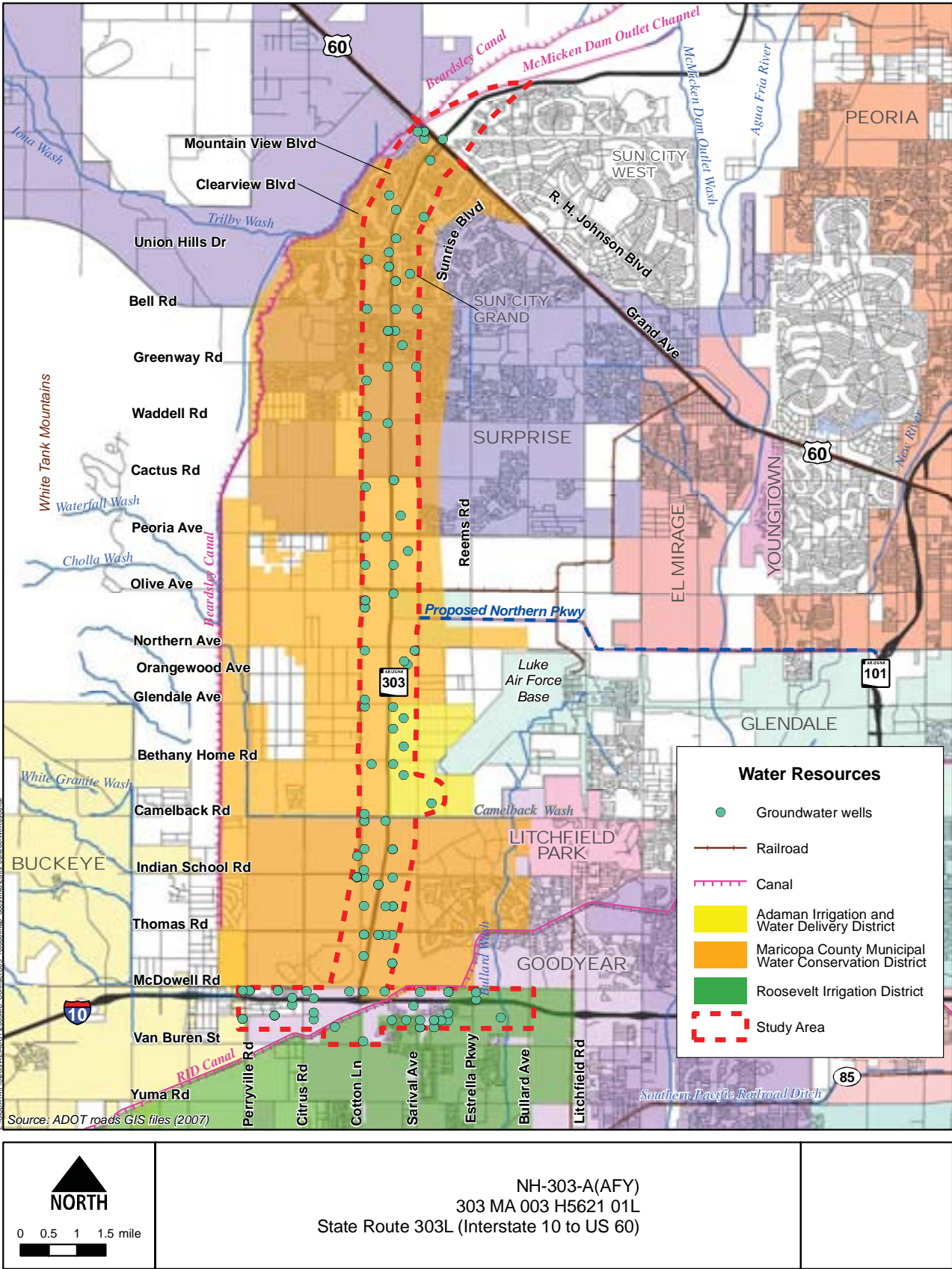
Surface Water

The Study Area is located in the Salt River Basin, which encompasses approximately 5,980 square miles and contains the Roosevelt, Apache, Saguaro, and Canyon reservoirs. More than 90 percent of the water in this basin originates upstream of Roosevelt Lake. The Salt River watershed is the primary source of domestic and agricultural water consumed in the Phoenix metropolitan area. The Granite Reef Dam and Diversion Structure, located approximately 45 miles east of the Study Area, diverts the majority of Salt and Verde river flows (including releases from upstream reservoirs) to an extensive canal system.

The canal system is funded and owned by the United States (U.S.) Department of the Interior Bureau of Reclamation and operated by Salt River Project for the purpose of delivering water for agricultural and domestic use. Historical records indicate that between 1940 and 1965, the Salt River channel through the Phoenix metropolitan area remained generally dry. Between 1965 and 1992, flows ranged from flood conditions to small releases resulting from increased rainfall in the watershed (Arizona Department of Water Resources [ADWR] 1999).

The Study Area is approximately 5 to 6 miles west of the Agua Fria River and approximately 5 miles north of the Gila River. The McMicken Dam Outlet Channel, the northern portion of the Trilby Wash Basin, and the RID canal are the major surface water features in the Study Area (see Figure 4-3, on page 72). Surface water in the Study Area drains to the southeast, toward the Agua Fria River (FCDMC 2005).

Figure 4-3. Water resources



Surface Water Quality

In Arizona, nonpoint source pollution causes most surface water quality impacts (Arizona Department of Environmental Quality [ADEQ] 2003). Roadway projects typically would affect surface water resources. Types of impacts can include increases in sediment loading into receiving water courses and the release of pollutants generated by vehicles using the completed facility. Creation of new roadways would increase the impervious surface area and increase runoff quantities and peak flow rates during storms.

Stormwater drainage from the existing roadway system in the Study Area is conveyed to the Agua Fria River by storm drain facilities and ephemeral washes, or may percolate into the ground in areas not served by storm drains. The McMicken Dam and Outlet Channel and the Trilby Wash Basin and Levee system protect and divert water around the communities of Surprise, Sun City West, and unincorporated areas of Maricopa County (FCDMC 2005).

The draft *2006 Status of Ambient Surface Water Quality in Arizona* report prepared by ADEQ describes the status of surface water resources in Arizona in relation to state water quality standards and fulfills requirements of the Clean Water Act (CWA) (ADEQ 2007a).

Water quality limited waters are water bodies assessed by ADEQ as having impaired quality that would require more than existing technology and permit controls to achieve or maintain water quality standards for intended uses in accordance with CWA Section 303(d). The CWA Section 303(d) list identifies those waters that are impaired and indicates the pollutant(s) causing impairment (ADEQ 2005). No reaches of the Agua Fria River near the Study Area are included in the CWA Section 303(d) draft list (ADEQ 2007b), nor on *Arizona's 2006 Not Attaining Waters* draft list (ADEQ 2007c).

FCDMC has interconnected and shared drainage systems with the municipalities in Maricopa County, and stormwater discharges from nearly all its facilities have the potential to reach the Gila River system (the Agua Fria River is a tributary to the Gila River). This has prompted FCDMC to work with municipalities and ADEQ to comply with the Arizona Pollutant Discharge Elimination System (AZPDES) regulations. FCDMC has negotiated with multiple municipalities to locate, identify, and eliminate pollutants associated with regulated discharges, where possible.

FCDMC also collects stormwater quality data for inclusion in the FCDMC regional stormwater quality database. As a result of collaboration with the municipalities on permit requirements, FCDMC operates a network of 16 stormwater quality monitoring stations throughout Maricopa County.

Potential sources of impacts on surface water quality in the Study Area include nonpoint source pollution and irrigation return flows.

Groundwater

The Study Area is located in the Phoenix Active Management Area (AMA), which is regulated by the State of Arizona through the Groundwater Management Act. Groundwater in the Phoenix AMA is a source of water for public use.

In 1985, the Central Arizona Project began deliveries of Colorado River surface water to urbanized areas of central Arizona (such as the Phoenix AMA), which has decreased the use of groundwater as a source of public water. Total groundwater use in the Phoenix AMA has been reduced from 1.1 million acre-feet in 1985 to 900,000 acre-feet in 1995 (ADWR 1999).

In 1995, total Phoenix AMA water use (all sources) was 58 percent for agriculture, 38 percent for municipal uses, and 4 percent for industrial purposes (ADWR 1999). Rapid population growth in the Phoenix metropolitan area has resulted in the retirement of agricultural land and the conversion of agricultural groundwater supplies to urban uses.

The West Salt River Valley Basin alluvial aquifer is located beneath the Study Area. The Phoenix AMA has a statutory goal of achieving safe yield by 2025. Safe yield occurs when the average quantity of groundwater pumped from AMA aquifers annually does not exceed the amount that is naturally or artificially recharged. Groundwater overdraft has created problems such as the loss of aquifer recharge storage capacity, land subsidence, and increased well drilling and pumping costs. In areas of severe groundwater depletion, the ground surface may also subside, causing cracks or fissures that can damage roads, building foundations, and other underground structures (Arizona Land Subsidence Group 2007).

ADWR administers groundwater use through the implementation of five successive management plan periods designed to produce a safe yield in the Phoenix AMA by 2025 (ADWR 1999).

Table 4-3, on this page, contains depth-to-groundwater data for select groundwater wells in feet below ground surface (ADWR 2003). The ADWR Groundwater Site Inventory database (ADWR 2006a) contains detailed well and groundwater data, and was used to confirm depth-to-groundwater data shown in the ADWR 2002–2003 water surface elevation maps.

Table 4-3. Depth to groundwater in the Study Area vicinity

Well location	Depth to groundwater below ground surface (in feet)
Van Buren Street at the RID ^a canal	156
Citrus Road at the RID canal	131
Cotton Lane, north of Interstate 10	159
Cotton Lane, north of Thomas Road	223
Cotton Lane, south of Glendale Avenue	317
Cotton Lane, south of Northern Avenue	376
Citrus Road, north of Northern Avenue	374
Cotton Lane and Olive Avenue	403
Cotton Lane, south of Cactus Road	418
Cotton Lane, north of Cactus Road	412
Sarival Avenue, north of Greenway Road	435
Citrus Road and Bell Road	504
167th Drive, south of Union Hills Drive	482
Cotton Lane, south of Union Hills Drive	481
Cotton Lane, south of Beardsley Road	494
Deer Valley Drive and 115th Avenue	485

Source: Arizona Department of Water Resources, 2003

^a Roosevelt Irrigation District

Groundwater Quality

The ability to use groundwater is limited both by the total concentration and the type of salt and mineral solids dissolved in the water. In the greater Phoenix metropolitan area, water containing more than 1,000 milligrams per liter (mg/L) of total dissolved solids is generally not preferred for potable water supply without treatment, but water containing as much as 3,000 mg/L of total dissolved solids is used for irrigation. The U.S. Environmental Protection Agency (EPA) secondary maximum contaminant level (nonenforceable) for total dissolved solids is 500 mg/L for potable water supplies.

The highest concentrations of nitrate generally occur in areas with a long history of irrigated agriculture. West Phoenix (which includes parts of Goodyear and unincorporated Maricopa County) is an area that falls into this category (MAG 2002). Sulfate concentrations above the EPA secondary maximum contaminant level of 250 mg/L are found in west Phoenix (MAG 2002).

Irrigation Districts

Three irrigation districts have conveyance infrastructure and member lands in the Study Area. The Maricopa County Municipal Water Conservation District member lands and main canal (called the Beardsley Canal) are located in the Study Area. The Adaman Irrigation and Water Delivery District has land in the Study Area. RID has irrigated land and irrigation infrastructure in the southern portion of the Study Area.

The Maricopa County Municipal Water Conservation District delivers Agua Fria River surface water through the Beardsley Canal and hundreds of miles of laterals (ADWR 1998). The Adaman Irrigation and Water Delivery District delivers both surface water and groundwater to its customers through a lined conveyance system; it also owns and operates 14 groundwater wells (ADWR 1998). RID irrigates agricultural land mostly with groundwater (approximately 85 percent of the water supply) that is pumped from its own wells (ADWR 1998). RID's main canal is located in the southern part of the Study Area.

Groundwater Wells

The proposed improvements could affect existing groundwater wells located within the R/W. ADWR regulates the drilling, installation, and abandonment of groundwater wells. ADWR maintains a database containing well information that is updated annually. The number and locations of wells within the Study Area were obtained using information from an ADWR database that identifies various types of wells, such as monitoring, piezometer, production, geotechnical, observation, domestic, test, irrigation, or abandoned wells.

According to the ADWR database (2007), 135 wells are located in the Study Area. This number includes active and abandoned wells (note that some of the well locations indicated on Figure 4-3, on page 72, encompass multiple wells at each location). ADWR well abandonment rules allow for five abandonment methods and variances, depending on well construction, depth, and aquifer variables such as groundwater contamination (ADWR 2001). Because of these allowable abandonment methods, it is possible that abandoned wells could have physical structures (such as well casings) remaining in the ground. Therefore, abandoned wells identified from the ADWR database are included in the total number of wells.

ADWR well replacement rules would need to be followed if groundwater wells were to be replaced. A well may need to be replaced because of anticipated physical damage or impact to the well casing or wellhead, restriction in required access to the wellhead, restricted use of the well, and/or administrative barriers to use of the well.

ADWR well spacing and replacement rules state that a person proposing to construct a replacement well that would be located in approximately the same location as the well it is replacing must file a notice of intent to drill the well, but is not required to obtain a well permit or comply with the well-spacing criteria stated in the ADWR rules (R12-15-1302 through R12-15-1307). According to R12-15-1308 (replacement wells in approximately the same location), the proposed replacement well is allowed to be located no more than 660 feet from the original well location without the requirement to conduct a new well hydrologic impact analysis (ADWR 2006b).

Subsidence

Land subsidence can change basin gradients, causing local flooding. Related earth fissures can affect linear infrastructure, such as roads and highways (Arizona Land Subsidence Group 2007). There are two documented cases of land subsidence near the Study Area: at Luke AFB and McMicken Dam.

New roadway construction near earth fissures must either avoid or mitigate the fissures. For example, the existing SR 202L (Red Mountain Freeway) crosses earth fissures, and mitigation measures were incorporated during its construction. Layers of densely compacted soil, geotextiles, geogrid screens, and steel-reinforced Portland cement concrete pavement were used to bridge over existing fissures.

2. Environmental Consequences

Preferred Alternative

Surface water quality impacts may result from implementation of the Preferred Alternative. Impacts may include increased sediment loading into receiving watercourses, runoff of pollutants from the proposed freeway, and soil erosion from exposed banks.

No groundwater quality impacts are expected as a result of implementation of the proposed project.

Groundwater wells may be physically affected as a result of the implementation of the Preferred Alternative. Effects on wells may include physical damage or impact to the well casing or wellhead, restriction in required access to the wellhead, restricted use of the well, and/or administrative

barriers to use of the well. If a well were affected by freeway construction, well abandonment and compensation (drilling a new well) may be required (ADWR 2001). ADOT would coordinate with well owners regarding well abandonment or relocation. Investigations regarding the relocation of groundwater wells would occur during the final design phase.

Irrigation water conveyance infrastructure (canals and laterals) associated with the Maricopa County Municipal Water Conservation District, RID, and Adaman Irrigation and Water Delivery District may be affected by implementation of the Preferred Alternative.

Land subsidence and earth fissures would be considered, as needed, during the final design phase. Further discussion of subsidence can be found in the Draft DCR.

No-Build Alternative

Selection of the No-Build Alternative would not result in any impacts on water quality or groundwater. Groundwater drawdown would continue while Study Area land would remain in agricultural use. Eventual conversion of this land to residential and other uses at build-out, however, would likely mean cessation of groundwater overdraft within the Study Area. Similarly, drawdown-related land subsidence would also likely cease with the end of agricultural land use. The issue of subsidence would not be a factor because no freeway improvements would be built.

3. Mitigation Measures

Mitigation measures to address surface water quality impacts are included in Part 4, Section D, *Clean Water Act*, on page 83.

- ADOT would coordinate with irrigation districts in the Study Area to address potential impacts on irrigation water conveyance infrastructure during the final design phase.
- Groundwater well impacts and acquisitions are handled by ADOT's Right-of-Way Group. If a well were affected by construction, well abandonment and compensation (drilling a new well) would be required. If a well were to be acquired, the water source would be replaced (ADOT 2005a).

4. Conclusion

Impacts on surface water quality would be expected to be minimal as a result of this proposed project. No impacts on groundwater quality would be expected under the Preferred Alternative. Impacts on irrigation water conveyance infrastructure would be expected, but mitigation measures could be implemented in coordination with the irrigation districts. Groundwater well impacts would likely occur, but mitigation measures could be implemented.

Under the No-Build Alternative, no impacts on water resources would be expected because no new freeway improvements would be built. Groundwater drawdown would continue while Study Area land would remain in agricultural use. Eventual conversion of this land to residential and other uses at build-out, however, would likely mean cessation of groundwater overdraft within the Study Area.

C. Floodplain Considerations

The Federal Emergency Management Agency (FEMA) manages the identification of floodplains within the United States. A floodplain is a relatively flat, lowland area that adjoins inland and coastal waters. The 100-year floodplain includes areas that are subject to a 1 percent or greater chance of flooding in any given year. The floodway is the area within the floodplain where the water is likely to be the deepest and fastest and which should be kept free of obstructions to allow floodwaters to move downstream. The limits of the 100-year floodplain can be found on FEMA Flood Insurance Rate Maps (FIRMs). The 100-year floodplain is divided into Special Flood Hazard Areas (SFHAs):

- Zone A: no base flood elevations determined
- Zone AE: areas have been studied in detail; base flood elevations are determined
- Zone AH: areas where ponding usually occurs and flood depths are between 1 and 3 feet
- Zone AO: areas where flood depths are between 1 and 3 feet, usually sheet flow on sloping terrain

In an effort to minimize impacts associated with the modification of floodplains, Executive Order 11988 (Floodplain Management) directs federal agencies to avoid actions located in or adversely affecting floodplains unless there is no practicable alternative, take action to mitigate losses if avoidance is not practicable, and establish a process for flood hazard evaluation based on the 100-year, or base flood, standard of the National Flood Insurance Program (NFIP).

1. Existing Conditions

The FIRMs for Maricopa County and incorporated areas that were used to determine the boundaries of the 100-year floodplain in the Study Area were: 040131145H, 040131585H, 040131595H, 040132055G, 040132060G, 040132070H, and 040132080J. The maps are dated September 30, 2005. For the purposes of this assessment, Zones A, AE, and AH of the 100-year floodplain were identified within the Study Area. Existing land use within the 100-year floodplain can be categorized as mostly agricultural with some residential development.

At the SR 303L/I-10 traffic interchange, the corridor latitudinally crosses the Roosevelt Canal floodplain in Zones AE and AH. The corridor makes one more latitudinal encroachment of Zone AE associated with a ditch running along Camelback Road.

There are three longitudinal encroachments of the 100-year floodplain within the Study Area—all falling within Zone AE. Running south to north along Cotton Lane, north of I-10, is an unnamed ditch. Running parallel to this at the western extent of the Study Area is the 100-year floodplain associated with the Beardsley Canal. In the northwestern portion of the Study Area is a small piece of a 100-year floodplain associated with an unnamed canal.

2. Environmental Consequences

Preferred Alternative

Potential impacts were evaluated in accordance with 23 C.F.R. Part 650(a), which prescribes the FHWA policy for the location and hydraulic design of highway encroachments on floodplains. Federally funded projects are assessed for flood risk impacts and must avoid incompatible use of floodplains and floodplain encroachment, minimize negative impacts on base flood elevations, and restore and preserve natural and beneficial floodplain values. The project must also be consistent with FEMA, state, and local government standards relative to the NFIP.

Because a latitudinal floodplain encroachment has a higher probability of affecting the floodway of a stream or river, latitudinal floodplain encroachments have a greater overall impact than longitudinal floodplain encroachments. Of the affected floodplains in the Study Area, two of these (at Roosevelt Canal and Camelback Road) would be affected by latitudinal encroachments. However, these encroachments would not have adverse impacts on floodplain values.

No-Build Alternative

The No-Build Alternative would have no impact on the 100-year floodplain because there would be no new freeway-related construction in the 100-year floodplain. However, continuing urban development may affect floodplains in the Study Area.

3. Mitigation Measures

- During final design, ADOT would coordinate with the FCDMC Floodplain Manager. The proposed project would be designed to minimize floodplain encroachments and not impair flood-carrying capacity. The project would be designed such that construction would not constitute a hazardous or incompatible use, would not result in greater than a 1-foot rise in base flood elevations, and would not affect natural or beneficial floodplain values.

Where the proposed project would cross the regulated floodplain created by the Roosevelt Canal, a regional detention basin would be constructed within and adjacent to the Arizona State Prison

Complex-Perryville, along with a series of roadway detention basins at the SR 303L/I-10 interchange. These basins are designed by FCDMC to balance any impacts on water surface elevations. The drainage outfall channel south of the Study Area would be designed by FCDMC so as not to affect the 100-year floodplain of the Gila River.

4. Conclusion

Under the Preferred Alternative, floodplain encroachments would not have adverse impacts on floodplain values. ADOT would coordinate with FCDMC during final design to minimize impacts.

There would be no impacts on the 100-year floodplain under the No-Build Alternative related to freeway improvements. However, continuing urban development may affect floodplains in the Study Area.

D. Clean Water Act

This section identifies the potential effects that the proposed SR 303L improvements may have on waters of the United States (Waters), which are regulated by the U.S. Army Corps of Engineers (USACE) under Sections 401, 402, and 404 of the CWA.

The USACE administers Section 404 of the CWA, which regulates the discharge of dredged or fill material into Waters, including wetlands, through the issuance of a nationwide permit (NWP) or an individual permit. An NWP is used if the project causes the loss of less than 0.5 acre of Waters that are nontidal, while an individual permit is used if more than 0.5 acre of Waters is permanently affected and/or if a special aquatic site (e.g., wetlands, which are a regional condition for Arizona) is filled. Other types of Waters that are regulated by USACE include ephemeral washes (washes that flow occasionally, after rainfall), perennial streams (streams with flowing water year-round), springs, and riverbeds. The functions and values of surface water are key components when addressing the Waters determination, assessing impacts, and defining mitigation. Prior to the establishment of a roadway alignment and the beginning of design, the type of permit needed from USACE is unknown.

Section 404 permits require water quality certification as set forth in Section 401 of the CWA prior to discharging fill material into Waters. Section 401 provides states with the authority to certify federally permitted activities in Waters in order to prevent violation of state water quality standards. On nontribal land, the certification process is administered by ADEQ. Currently, NWP 14 is conditionally certified for water quality, and an individual permit requires a separate application for certification. Every Section 404 permit requires compliance with the Section 401 water quality certification conditions in order for the permit to be valid.

Section 402 of the CWA pertains, in part, to the maintenance of water quality by managing stormwater runoff from projects affecting 1 or more acres. In Arizona, ADEQ administers this section of the CWA. Permitting requires that project proponents complete a Stormwater Pollution Prevention Plan (SWPPP) for the construction phases and that the overall project design provide for the protection of Waters. These plans require the implementation of best management practices used to prevent construction waste from entering the nation's waterways through surface water runoff. The SWPPP must incorporate temporary control measures during construction, permanent control measures when the project is completed, and best management practices for the control and prevention of release of nonstormwater discharges.

Because the proposed improvements would affect approximately 960 acres, construction of the project would be subject to provisions of Section 402 of the CWA and an AZPDES permit would be needed from ADEQ prior to project construction. ADOT would acquire an AZPDES permit for the project.

1. Existing Conditions

No Waters exist in the Study Area. The Gila River is located approximately 5 miles south of the Study Area. It flows east to west, acting as a stormwater conveyance channel in the region and offering some attenuation of flood flows.

2. Environmental Consequences

Preferred Alternative

The proposed SR 303L project would not affect Waters. The freeway-related outfall channel to the Gila River being planned by FCDMC would not encroach on the Gila River, as defined by the USACE-approved jurisdictional delineation (December 2004), and, therefore, there would be no impacts to Waters related to the outfall channel. At this time, no Section 404 permit or Section 401 water quality certification is anticipated to be necessary for the proposed project.

No-Build Alternative

Selection of the No-Build Alternative would not result in any impacts on Waters or water quality. There would be no construction that could create project-related erosion or sediment deposits in existing watercourses. Existing topography would not be modified because no ground excavation or fill would occur. Eventual conversion of Study Area land to residential and other uses, however, could result in erosion, runoff, and other impacts to Waters and water quality. Traffic volumes on arterial and other streets would likely increase, resulting in increased generation of traffic-related pollutants over a larger area than would be affected by the proposed improvements alone.

3. Mitigation Measures

The project would be subject to Section 402 of the CWA, and the following permitting process would be followed:

- The ADOT Roadside Development Section would determine who would prepare the SWPPP Index Sheet.

- The ADOT Phoenix Construction District Office and the contractor would submit the AZPDES Notice of Intent (NOI) and Notice of Termination (NOT) to ADEQ.

4. Conclusion

Under the Preferred Alternative, there would be no impacts on Waters. Impacts on water quality resulting from stormwater runoff are expected to be minimal as a result of implementation of this proposed project. The CWA Section 402 permit would include applicable mitigation measures to address potential impacts on water quality.

Under the No-Build Alternative, no impacts on Waters or water quality would occur. Eventual conversion of Study Area land to residential and other uses, however, could result in erosion, runoff, and other impacts to Waters and water quality. Traffic volumes on arterial and other streets would likely increase, resulting in increased generation of traffic-related pollutants over a larger area than would be affected by the proposed improvements alone.

E. Biological Resources

This section describes biological resources that may be affected by the proposed project. It discusses vegetation and wildlife, threatened and endangered species, special-status species, protected native plants, and invasive species.

1. Existing Conditions

The SR 303L Study Area is located in the Lower Colorado River Valley subdivision of the Sonoran Desertscrub Biotic Community (Turner and Brown 1994). However, a majority of the Study Area has been converted to agriculture. North of Cactus Road, land use consists of residential communities and commercial operations. Because of anticipated housing construction to support population growth in the region, agricultural land in the Study Area is expected to be converted to residential and commercial land uses. Natural vegetation is scarce in the Study Area.

Vegetation and Wildlife

The Study Area's agricultural fields are irrigated from ditches and canals. The canals are either concrete-lined or earthen. The earthen canals support sparse vegetation that could be used by various wildlife species. Between the agricultural fields themselves and the earthen canals, there is ample habitat for wildlife species. Small mammals such as mice (*Peromyscus* spp.) and black-tailed jackrabbits (*Lepus californicus*) are numerous. Common reptiles include garter snakes (*Thamnophis* spp.) and the side-blotched lizard (*Uta stansburiana*), among others. A variety of bird species nest and forage within the Study Area. These species include song birds (blackbirds, meadowlarks), wading birds (herons, egrets, ibises), and raptors (red-tailed hawks, ferruginous hawks, harriers, burrowing owls). The residential neighborhoods in the Study Area are landscaped and provide marginal habitat for bird species best adapted to urban environments (pigeons, sparrows, grackles).

Native vegetation within the Study Area occurs as isolated and individual trees of blue paloverde (*Cercidium floridum*), velvet mesquite (*Prosopis velutina*), and a scattering of creosote bush (*Larrea tridentata*).

Threatened and Endangered Species

The U.S. Fish and Wildlife Service (USFWS) list of threatened, endangered, proposed, candidate, and conservation agreement (federally listed) species for Maricopa County was obtained from the Arizona Ecological Services Field Office Web site (list date: July 11, 2007) and reviewed by a qualified biologist to determine species potentially present in the Study Area. Of the 14 species on the Maricopa County list, four species were determined to potentially occur in the Study Area. One

species that has been delisted (the cactus ferruginous pygmy-owl), but petitioned for relisting, was also determined to potentially occur in the Study Area.

A biological evaluation (BE) was prepared. The BE limits extended from the south near the Gila River to US 60 at the northern end of the corridor. No species-specific surveys were conducted in association with this project. Species evaluated are listed in Table 4-4, on this page.

Table 4-4. Species listed by USFWS for Maricopa County with the potential to occur in the Study Area

Common name	Scientific name	Status
California brown pelican	<i>Pelecanus occidentalis californicus</i>	Endangered
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Endangered
Yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	Candidate
Yuma clapper rail	<i>Rallus longirostris yumanensis</i>	Endangered
Cactus ferruginous pygmy-owl	<i>Glaucidium brasilianum cactorum</i>	Delisted

Source: U.S. Fish and Wildlife Service, 2007

Special-Status Species

In addition to reviewing federally listed species, the Arizona Game and Fish Department (AGFD) “Environmental Review On-line Tool” was queried to identify special-status species occurring within 3 miles of the Study Area. The review tool identified records for two species: the lowland leopard frog (*Rana yavapaiensis*), a State of Arizona wildlife species of concern, and the Western burrowing owl (*Athene cunicularia hypugaea*), a species of concern under the Endangered Species Act.

The lowland leopard frog is a generalist that breeds in a variety of natural and man-made aquatic systems such as irrigation canals (AGFD 2001). Although natural aquatic habitats or streams do not exist within the SR 303L corridor, suitable habitat exists in the form of irrigation ditches, where lowland leopard frogs have been documented as occurring in the Study Area. Suitable habitat also exists for the Western burrowing owl; foraging and nesting habitat is present within the agricultural fields and earthen ditches of the Study Area.

Wildlife Movement and Corridors

Linear transportation features such as roads and highways can fragment wildlife habitat and act as physical barriers to wildlife movement. Wildlife movement corridors are generally narrow strips of habitat that may be used by wildlife to move from one area of habitat to another. Other corridors include those across or near geological features that offer good physical relief and/or vegetative

cover. Wildlife movement within these corridors is crucial to maintain healthy wildlife populations, and, as it occurs, it creates a synergistic effect that increases the overall quality and carrying capacity of the habitat. Fragmentation can prevent wildlife from accessing required resources and isolate populations from each other, resulting in a reduction in genetic diversity that can undermine a population's long-term viability. In Arizona, wildlife movement corridors are often ephemeral washes with associated riparian habitat.

Impacts on wildlife and wildlife movement are related to the type of linear feature and amount of usage. The roadway type, width, design, and location are key factors that contribute to this barrier effect and to the impact on wildlife movement. Other features associated with roads, such as R/W fencing and line-of-sight clearance, may also contribute to the impacts on wildlife and wildlife movement. Roads acting as barriers can suppress populations of certain wildlife species occurring near them, primarily by direct mortality (road kill) and the reduction of genetic viability.

As discussed earlier, the majority of the Study Area has been converted to agricultural and residential land uses, limiting wildlife speciation primarily to birds and small mammals, reptiles, and amphibians. These species are limited to those that can utilize agricultural and residential habitats. The range of movement of the terrestrial animals is relatively small. In the Study Area, wildlife movement for the terrestrial animals may include crossing over existing roads to reach different agricultural fields for foraging purposes. Avian species, because of their ability to fly, can travel in and out of the Study Area freely.

In 2006, the Arizona Wildlife Linkages Workgroup completed *Arizona's Wildlife Linkages Assessment*, which identifies the locations of known wildlife movement, associated corridors, and wildlife linkage zones in Arizona. A review of the assessment did not reveal any designated wildlife corridors within the Study Area. South of the Study Area, the "Gila/Salt River Corridor Granite Reef Dam" linkage zone exists in the form of the Gila River. This linkage zone presently supports avian species, small mammals and reptiles, and predator species such as the coyote. It may be capable of supporting larger wildlife species such as cougars and bighorn sheep.

Within the Study Area, wildlife movement may occur in any direction because there is no existing wildlife corridor that would guide the movement of species. Movement from the south into the Study Area is unlikely because of a natural barrier in the form of the Gila River.

Protected Native Plants

Native plants protected by the Arizona Native Plant Law include all cacti, yucca, agave, and many leguminous tree species such as paloverde, mesquite, and ironwood that are wild-growing (i.e., not planted for landscaping).

While no formal inventory of protected native plants within the construction limits of the Preferred Alternative has been conducted, protected native plant species (including mesquite and paloverde) have been observed in the SR 303L corridor.

Invasive Species

Under Executive Order 13112, dated February 3, 1999, projects that occur on federal land or that are federally funded must: "... subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded ..."

A formal invasive species survey in the field was not completed for the Preferred Alternative. However, the nonnative salt cedar is known to occur within the corridor. Because other nonnative species are known to occur in the Phoenix metropolitan area, and because farming and construction activity have a tendency to introduce invasive species, it is likely that invasive species are present throughout the SR 303L corridor. Thickets of salt cedar were identified through aerial photography and geographic information system mapping.

2. Environmental Consequences

Vegetation and Wildlife

Preferred Alternative

Construction of the Preferred Alternative would result in the loss of portions of agricultural cropland and smaller portions of desert scrub along the corridor. Because construction would be confined to previously disturbed land, direct impacts on native vegetation would be minimal. Wildlife species utilizing agricultural land would be most heavily affected by habitat loss. However, ample agricultural and residential land exists adjacent to the Study Area, providing suitable foraging habitat.

No-Build Alternative

The No-Build Alternative would not affect vegetation or wildlife in the Study Area. However, residential and commercial development would continue in the Study Area, converting agricultural land and causing habitat loss and the displacement of species.

Threatened and Endangered Species

Preferred Alternative

- California brown pelican – This species has not been documented in the Study Area. No suitable habitat is located in the Study Area. Therefore, the California brown pelican would not be affected by the proposed project.
- Southwestern willow flycatcher – This species has not been documented as occurring in the Study Area. Potential breeding habitat exists along the Gila River, which is outside of the Study Area. Therefore, the proposed project would not affect the Southwestern willow flycatcher.
- Yellow-billed cuckoo – This species has not been documented as occurring in the Study Area. Potential breeding habitat exists along the Gila River, which is outside of the Study Area. Therefore, the proposed project would not affect the yellow-billed cuckoo.
- Yuma clapper rail – This species has not been documented as occurring in the Study Area. Potential breeding habitat exists along the Gila River, which is outside of the Study Area. Therefore, the proposed project would not affect the Yuma clapper rail.
- Cactus ferruginous pygmy-owl – This species has not been documented as occurring in the Study Area. The species was delisted by USFWS in 2006, but a petition was filed on March 15, 2007, to relist the species as an endangered species. The Study Area lies within former survey zone 3, which has been identified as areas within the historic range of the pygmy-owl with a low potential of occupancy. Extensive surveys have been conducted in the Study Area in recent years; however, the species has not been reported in Maricopa County since the early 1970s.¹ No suitable nesting habitat exists in the Study Area; therefore, the cactus ferruginous pygmy-owl would not be affected by the proposed project.

No-Build Alternative

The No-Build Alternative would not affect federally listed species. However, residential and commercial development would continue in the region, which could affect federally listed species.

¹ telephone communications with Sabra Schwartz, AGFD, December 2003 and March 2005

Special-Status Species

Preferred Alternative

- Lowland leopard frog – Construction of the proposed project would remove irrigation canals that are suitable habitat for the lowland leopard frog.
- Western burrowing owl – Construction of the project would remove agricultural land and earthen ditches that are suitable nesting and foraging habitat for the Western burrowing owl.

While habitat for special-status species would be removed by the proposed project, there is an abundance of suitable habitat adjacent to the project area, making impacts to each special-status species minimal.

No-Build Alternative

Selection of the No-Build Alternative would not result in any impacts on special-status species. However, residential and commercial development would continue in the region, which could affect special-status species.

Wildlife Movement and Corridors

Preferred Alternative

No wildlife corridors exist in the Study Area that would be affected by the proposed project. Presently, terrestrial wildlife may move in any direction to cross existing roads while moving from one agricultural field to another. The proposed project would result in a wider SR 303L roadway and increased traffic flow, which could cause an increase in road kill of wildlife moving east–west through the Study Area.

No-Build Alternative

The No-Build Alternative would not affect wildlife movement in the Study Area. However, residential and commercial development would continue in the region, which could affect wildlife movement.

Protected Native Plants

Preferred Alternative

Because protected native plants have been observed in the Preferred Alternative, construction would affect protected native plants.

No-Build Alternative

The No-Build Alternative would not affect protected native plants. However, residential and commercial development would continue in the region, which could affect protected native plants.

Invasive Species

Preferred Alternative

Construction activities would have the potential to introduce and/or spread invasive species within the Study Area. This could occur as a result of hauling and earthmoving equipment that could transport seeds and other invasive plant materials from previous project sites to the current construction site and from one portion of the construction limits to another.

No-Build Alternative

The No-Build Alternative would not result in the spread or introduction of invasive species. However, residential and commercial development would continue in the region, which could affect the spread and introduction of invasive species.

3. Mitigation Measures

Vegetation and Wildlife

Because there would be minimal impacts on vegetation and wildlife, no mitigation measures would be needed.

Threatened and Endangered Species

Because there would be no impacts on threatened and endangered species, no mitigation measures would be needed.

Special-Status Species

While habitat for special-status species would be removed by the project, there is an abundance of suitable habitat adjacent to the project area, making impacts to each special-status species minimal. Mitigation measures for the lowland leopard frog would not be necessary.

- Prior to construction, surveys for the Western burrowing owl would be conducted in accordance with AGFD's *Burrowing Owl Project Clearance Guidance for Landowners* (2008).

Wildlife Movement and Corridors

Because no wildlife corridors exist in the Study Area, no mitigation measures would be necessary.

Protected Native Plants

- Protected native plants within the construction limits would be affected by the project; therefore, ADOT would notify the Arizona Department of Agriculture at least 60 days prior to the start of construction so that the Arizona Department of Agriculture could determine the disposition of these plants.

Invasive Species

- All disturbed soils that would not be landscaped or otherwise permanently stabilized by construction would be seeded using species native to the project vicinity.
- To prevent the introduction of invasive species seeds, all construction equipment would be washed at the contractor's storage facility prior to entering the construction site.
- To prevent invasive species seeds from leaving the construction site, the contractor would inspect all construction equipment and remove all attached plant/vegetation debris prior to allowing that equipment to leave the construction site.

4. Conclusion

Under the Preferred Alternative, suitable habitat for wildlife and special-status species would be removed. However, the BE determined that no federally listed species would be affected by the proposed project. No wildlife corridors exist in the Study Area that would be affected by the proposed project. The project would affect protected native plants, but coordination with the Arizona Department of Agriculture on mitigation efforts would help minimize impacts. The project could introduce invasive species to the Study Area, but this could also be minimized through appropriate mitigation measures.

Under the No-Build Alternative, while no direct impacts on biological resources would occur because no new improvements would be built, continuing urban development may affect biological resources in the Study Area.

F. Visual Resources

1. Existing Conditions

From south to north, the Study Area varies greatly in visual character. In the southern end, from south of I-10 to Greenway Road, the general foreground views consist of agricultural fields, orchards, open space (with the exceptions of the Arizona State Prison Complex-Perryville and dispersed farmhouses), and new residential areas with introduced trees and grasses. The northern end of the project, from Greenway Road to north of US 60, has views of new and developing subdivisions with landscaped areas, community perimeter walls, and major overhead power lines.

Overall, the Study Area has limited undisturbed natural vegetation because adjacent properties are either developed or in agricultural use. General background views are of the Hieroglyphic Mountains to the north, the White Tank Mountains to the west, and the Gila River and Sierra Estrella to the south. Middle distant and foreground views represent highly modified landscape elements attributable to agricultural and residential development.

For analytical purposes, residential areas were considered highly sensitive viewing areas. SR 303L, itself, was considered a moderately to highly sensitive viewing area. Accordingly, impacts were evaluated for both existing residential areas and for the public traveling along SR 303L. A matrix was established to facilitate evaluation of visual impact significance for sensitive viewers. The extent of impact on visual resources was determined by combining project visibility and viewer sensitivity levels. A brief definition of these two criteria and the impact levels are provided below.

Visual Quality Impacts Criteria

- Project visibility – an evaluation of the potential view of the proposed project and the available screening (i.e., whether a physical barrier such as a wall or berm would block direct views)
- Viewer sensitivity level – the anticipated level of sensitivity a viewer may have for changes occurring within the viewsheds

Impact Levels

- High impact – would likely cause a substantial long-term and adverse effect on landscape character/visual quality because of the contrast between the proposed project and the level of existing scenic integrity; would likely cause a severe long-term and adverse effect on a viewshed considered highly susceptible to changes in scenic integrity and possessing high viewer sensitivity, low ability to visually absorb project elements, and relatively long duration of viewer exposure

- Moderate impact – would create (for sensitive viewers) a noticeable—but not substantial—deviation from the existing visual setting that would be of moderate-to-low severity in a viewshed susceptible to changes in its ability to visually absorb project elements and to changes in the duration of views it affords
- Low-to-moderate impact – would create (for sensitive viewers) a slightly noticeable deviation from the existing visual setting; this level of deviation would be of low severity in a viewshed susceptible to changes in its ability to visually absorb project elements and to changes in the duration of views it affords
- Low impact – would create a low-to-negligible deviation from the existing visual setting in a viewshed readily able to visually absorb project elements and one that provides only a short duration of exposure to sensitive viewers

Table 4-5, on this page, illustrates how these criteria and impact levels were applied.

Table 4-5. Visual quality impact criteria

Sensitive viewer type	Screening ^a	Impact of freeway design on visual quality		
		Elevated	Depressed	At-grade
Resident	Unscreened	High	Low-to-moderate	Low-to-moderate
	Screened	Moderate	Low	Low-to-moderate
Traveling public	Unscreened	Moderate	Low	Low-to-moderate
	Screened	Low-to moderate	Low	Low

^a indicates physical barrier (wall or berm) present

2. Environmental Consequences

Preferred Alternative

As can be seen in Table 4-5, on this page, impacts on visual quality would be variable and would rely on the location of a sensitive viewer relative to the freeway. Generally, areas that would be depressed (known as “viewer-superior positions”), whether screened or unscreened, are expected to experience low-to-moderate impacts. Screened and unscreened at-grade areas (known as “viewer-neutral positions”) would have low-to-moderate impacts on sensitive viewers. Screened and unscreened elevated areas (known as “viewer-inferior positions”) would have a range of impacts, depending on the actual location of the sensitive viewer and the sensitive viewer type. Elevated areas would have a low impact on the traveling public and moderate-to-high impacts on area residents.

Of particular note would be the system traffic interchange planned for SR 303L and I-10. This would be the tallest structure in the proposed project, extending possibly 75 feet above ground level and having four visible levels (a fifth level would be depressed). Landscape treatment or other screening devices would have little effect in mitigating adverse visual effects of a structure of this magnitude. Residents of the Canyon Trails subdivision at I-10 and Cotton Lane would experience the greatest adverse visual impact because of their proximity to this structure. The other system traffic interchange would be more modest in height and impact. The SR 303L/Northern Parkway system traffic interchange would have its highest ramp about 50 feet above the existing, surrounding roads. This is about half the height of the proposed I-10/SR 303L interchange. The SR 303L/US 60 service traffic interchange would have no additional levels above the existing bridge. Views in the Sun City West and Sun City Grand vicinity would, therefore, not substantially change.

The ultimate freeway facility, with overpasses, ramps, lighting, fencing, and median and shoulder landscaping (using desert, low-water use plants) would change the visual character of the area. The viewer position relative to the grade level of the roadway and the proximity of the proposed project to sensitive viewers would be the greatest influences on the impacts on visual quality. The traveling public would experience low-to-moderate impacts on visual quality because the freeway's rolling profile (depressed, at-grade, and elevated) would offer motorists long-range views of area mountains and would limit views in depressed sections. Area residents would experience anywhere from low to high impacts, with above-grade portions of the roadway creating the highest impacts because of the freeway's greater visibility.

In addition to the physical presence of the roadway itself, associated structures such as drainage facilities and lighting would adversely affect sensitive viewers. Because drainage canals and retention basins associated with the proposed improvements would be at-grade or below-grade, they would cause less severe impacts on sensitive viewers than would major freeway structures. Lighting, however, would have adverse impacts on sensitive viewers. While proper lighting of a freeway is imperative for safety, it can be visually intrusive, especially to those who reside close to the freeway. Furthermore, addition of freeway lighting would alter the visual experience of motorists along the nearby arterial street system. Existing nighttime views of the SR 303L corridor are largely of a vast, dark rural area (this is less true for the residential and commercial areas north of Cactus Road). Introduction of freeway lighting (high masts and bright luminaires casting substantial incidental light), would alter the existing visual experience for surrounding residents and the traveling public, creating a more urban context. The degree of perception of nighttime light

intrusion would depend on the extent of other various developments existing by a given year and the extent of light spilling over from those developments.

Landscape treatments along the proposed freeway and edges of detention basins could soften the appearance of the facilities' concrete surfaces. Roadway landscaping is standard when constructing ADOT freeway facilities. The extent of landscape development is, however, typically limited unless local governments partner with ADOT to enhance the ultimate effect.

“Spillover” of incidental light from high-mast freeway lighting is a noted concern from the public adjacent to SR 303L and has the potential to adversely affect the visual experience of nearby residents.

No-Build Alternative

If the No-Build Alternative were to be selected, the proposed improvements and associated drainage basins and conveyances would not be built. Traffic congestion on SR 303L, which would function much as an arterial street in 2030 if the improvements were not implemented (see Part 2, *Project Purpose and Need*, on page 10), would mean that motorists would be less able to enjoy the surrounding landscapes and distant views. Lack of grade-separated bridges would also mean that motorists could not enjoy more unimpeded views of distant mountains and other landscape. While high-mast freeway lighting would not become part of the nighttime landscape under the No-Build Alternative, continued urban development would compromise the current, relatively dark-sky conditions. Lighting along arterial streets and for commercial facilities and their parking lots would contribute to the perception of light intrusion.

3. Mitigation Measures

- Landscaping treatment would be developed in coordination with the ADOT Roadside Development Section and would incorporate native or low-water-use plants as identified by ADWR. Landscaping would be consistent with conservation-oriented water uses in the Phoenix AMA.
- To reduce lighting spillover into residential areas, shielded or cut-off fixtures would be used along the freeway main line. The height of the masts would be minimized, within constraints of existing highway design standards and safety considerations.

4. Conclusion

Under the Preferred Alternative, elevated portions of the proposed project—especially the proposed nearly 75-foot-tall system traffic interchange at SR 303L and I-10—would have moderate-to-high visual impacts on adjacent residents. Depressed and at-grade portions of the proposed project would have low-to-moderate visual impacts on adjacent residents. Adherence to mitigation measures (shielded or cut-off light fixtures along the freeway) would reduce the impact of spillover lighting into residential areas if the Preferred Alternative were selected.

Under the No-Build Alternative, SR 303L would function as an arterial street in 2030 if the proposed improvements were not implemented (see Part 2, *Project Purpose and Need*, on page 10), and motorists would be less able to enjoy the surrounding landscapes and distant views because of preoccupation with heavy traffic congestion. Continued urban development would compromise the current, relatively dark-sky conditions. Lighting along arterial streets and for commercial facilities and their parking lots would contribute to the perception of light intrusion.

G. Air Quality

The air quality technical study completed for this Draft EA evaluated transportation-related air quality impacts associated with the proposed improvements to SR 303L (ADOT 2007a). The 1990 federal Clean Air Act (CAA) amendments and NEPA require that air quality impacts be addressed in the preparation of environmental documents. The level of effort used to evaluate these impacts may range from a simple description to a detailed microscale analysis, depending on factors such as type of document to be prepared, project location and size, study area meteorology, air quality attainment status of the area, and federal and state air quality standards.

The air quality analysis performed to assess impacts from the proposed improvements to SR 303L focused on vehicle emissions of carbon monoxide. Other pollutants are also components of vehicular emissions; however, carbon monoxide is the primary pollutant of vehicular emissions. Ozone, nitrogen oxides, and hydrocarbons are pollutants that are regional in nature and, as such, meaningful evaluation at the project level is not possible. EPA is currently developing procedures for analyzing microscale particulate matter pollution impacts, but guidance is not available at this time. A qualitative hot-spot analysis of particulate matter was conducted.

Mobile source air toxics (MSATs) are also components of vehicular emissions. In 2006, FHWA issued its “Interim Guidance on Air Toxic Analysis in NEPA Documents” (FHWA 2006). An updated analysis of MSATs has been conducted.

1. Existing Conditions

Extremely hot summers, mild winters, and little precipitation characterize the Study Area. Daily maximum temperatures during the summer average near 107°F while average minimum daily temperatures during the winter are in the mid-30s (°F). Precipitation received in the area averages nearly 9 inches per year, arriving in the form of rain associated with afternoon showers or thunderstorms during the late summer and with middle-latitude storms in the Pacific that move eastward during the winter. Snowfall is rare. The closest weather station to the Study Area is located in Litchfield Park, approximately 4 miles to the east. A summary of temperature and precipitation recorded in Litchfield Park, Arizona, from 1971 to 2000, is presented in Table 4-6, on page 100.

Table 4-6. Climatological summary, Litchfield Park, Arizona, 1971–2000

Month	Temperature (°F)			Precipitation (inches)	
	Average	Average daily maximum	Average daily minimum	Average	Monthly maximum
January	52.2	67.0	37.4	0.96	6.14
February	56.5	72.3	40.6	1.13	4.24
March	61.1	77.3	44.8	1.10	4.05
April	68.5	86.2	50.7	0.30	1.36
May	77.4	95.3	59.4	0.12	1.42
June	86.8	105.2	68.3	0.05	0.50
July	91.5	107.6	75.4	0.71	4.10
August	90.1	105.8	74.4	0.95	2.68
September	84.1	100.8	67.3	0.93	4.27
October	72.3	89.9	54.7	0.71	3.29
November	59.5	76.1	42.8	0.69	2.77
December	52.0	67.2	36.7	0.97	4.20
Annual	71.0	87.6	54.4	8.62	6.14

Source: Western Regional Climate Center, 2007

Note: The Litchfield Park weather station is the closest to the Study Area.

The locations of the data sources used in this report to describe the general climatology and air quality of the Study Area are presented in Figure 4-4, on page 101.

NAAQS Criteria Pollutants

The National Ambient Air Quality Standards (NAAQS) were first established in 1970 under the CAA. They are based on scientific studies that show how air pollutants at or below the NAAQS protect sensitive subgroups (people with asthma or other respiratory illnesses) from health effects caused by the pollution. Six pollutants, referred to as “criteria pollutants,” were placed under regulation and limits were established for acceptable ambient concentrations. Two federal standards exist for most of the criteria pollutants. The primary standard defines levels deemed “necessary, with an adequate margin of safety, to protect the public health.” The secondary standard defines levels “necessary to protect the public welfare” (40 C.F.R. Part 50). The promulgation of these standards does not prohibit any state from establishing air quality standards that are more stringent. The federal standards are also subject to periodic review and revision by EPA.

Monitoring Sites

- 1 Air quality (Bell and Dysart roads)
- 2 Air quality (6000 West Olive Avenue)
- Climatology
- Meteorology
- Study Area

Source: ADOT roads GIS files (2007)

NORTH

0 0.5 1 1.5 mile

NH-303-A(AFY)
303 MA 003 H5621 01L
State Route 303L (Interstate 10 to US 60)

Currently, the criteria pollutants are carbon monoxide, nitrogen dioxide, ozone, particulate matter (PM₁₀), fine particulate matter (PM_{2.5}), sulfur dioxide, and lead. Since the NAAQS were established, revisions have been made that modify which pollutants are regulated, the allowable ambient concentrations, and the time interval over which the pollutant is measured.

The NAAQS for the criteria pollutants are presented in Table 4-7, on this page.

Table 4-7. National Ambient Air Quality Standards

Pollutant	Averaging time	Primary standard	Secondary standard
Carbon monoxide	1-hour	35 ppm ^a	no standard
	8-hour	9 ppm	no standard
Nitrogen dioxide	Annual	0.05 ppm	0.05 ppm
Ozone	8-hour	0.075 ppm	0.075 ppm
Particulate matter ^b	24-hour	150 µg/m ³ ^c	150 µg/m ³
	Annual ^d	50 µg/m ³	50 µg/m ³
Fine particulate matter ^e	24-hour	35 µg/m ³	35 µg/m ³
	Annual	15 µg/m ³	15 µg/m ³
Sulfur dioxide	3-hour	no standard	0.5 ppm
	24-hour	0.14 ppm	no standard
	Annual	0.03 ppm	no standard
Lead	quarterly	1.5 µg/m ³	1.5 µg/m ³

Source: 40 C.F.R. Part 50

Note: The 8-hour ozone standard is based on the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor over each year.

^a parts per million

^b airborne particles less than or equal to 10 microns in diameter

^c micrograms per cubic meter

^d Although the annual PM₁₀ standard was revoked in 2006, it is displayed in this table because the control measures to attain the annual standard remain in the State Implementation Plan for the nonattainment area in Phoenix.

^e airborne particles less than or equal to 2.5 microns in diameter

A description of the criteria pollutants follows:

- Carbon monoxide, which is produced in vehicular emissions, is a colorless, odorless gas that primarily affects the cardiovascular system.
- Nitrogen dioxide is a gas with a yellowish-orange to reddish-brown appearance that impairs the respiratory system. Sources of this pollutant include power plants and vehicular emissions.
- Ozone is created through a complex reaction of hydrocarbons and oxides of nitrogen, with sunlight as the primary catalyst. Ozone affects the respiratory system. Sources of the ozone precursors include vehicle emissions, power plants, and service stations.
- Particulate matter refers to small aerosols that are suspended in the atmosphere and may cause irritation and damage to the respiratory system. Vehicular emissions and the resuspension of road dust by vehicular activity are sources of this pollutant. PM₁₀ refers to particulate matter with a diameter less than 10 microns, while PM_{2.5} refers to particles with diameters less than 2.5 microns.
- Sulfur dioxide is a colorless gas generated by the combustion of sulfur-containing fuels. It primarily affects the respiratory system. Sources of this pollutant are power plants and other industrial facilities that burn sulfur-containing fuels.
- Lead and its compounds damage the cardiovascular, renal, and nervous systems. Ambient levels have been reduced significantly since the removal of lead from fuel.

The CAA amendments of 1990 authorized EPA to designate those areas that have not met the NAAQS as being in “nonattainment” and to classify them according to their degree of severity. States that fail to attain the NAAQS for any of the criteria pollutants are required to submit State Implementation Plans (SIPs) that outline those actions that will be taken to attain compliance.

The Study Area lies within nonattainment areas for ozone and PM₁₀. The nonattainment area for 8-hour ozone is a large area of Maricopa County and a small portion of Pinal County. The nonattainment area for PM₁₀ is an approximately 48- by 60-mile rectangular section of eastern Maricopa County plus a 6- by 6-mile section that includes Apache Junction in Pinal County. The Study Area is also in a maintenance area for carbon monoxide, which encompasses most of the metropolitan Phoenix area.

The Maricopa County Air Quality Department (MCAQD) and ADEQ maintain a network of air quality monitoring sites throughout Maricopa County. Most of these sites are located in Phoenix and the surrounding communities. Monitoring sites are not necessarily identical—some may monitor only one or two criteria pollutants. Air quality data from two locations were selected for

consideration in this study because of the pollutants monitored and/or their relative proximity to the Study Area. Each location is identified in Figure 4-4, on page 101. Pollutant concentrations recorded at these locations during 2007 are summarized in Table 4-8, on this page.

Table 4-8. 2007 air quality summary, maximum ambient concentrations

Location	Pollutant	Averaging time	Concentration	Number of exceedances
Bell and Dysart roads Surprise, Arizona (Number 1 on Figure 4-4, on page 101)	PM ₁₀	24-hour	111 µg/m ³ ^a	0
	Ozone	8-hour	0.069 ppm ^{b, c}	0
	Carbon monoxide	8-hour	2.2 ppm ^d	0
6000 West Olive Avenue Glendale, Arizona (Number 2 on Figure 4-4, on page 101)	PM ₁₀	24-hour	92 µg/m ³	0
	Ozone	8-hour	0.075 ppm ^c	0
	Carbon monoxide	8-hour	1.8 ppm ^d	0

Source: Maricopa County Air Quality Department, 2007

^a micrograms per cubic meter

^b parts per million

^c seasonal average from April 1 to November 1

^d seasonal average from September 1 to April 1

During 2007, none of the maximum concentrations obtained at the two monitoring locations exceeded the NAAQS. Maximum concentrations of carbon monoxide were well below the NAAQS, as were the maximum 24-hour concentrations of PM₁₀. Maximum concentrations of ozone were near the standard, but there was no exceedance. The remaining criteria pollutants, nitrogen dioxide, sulfur dioxide, PM_{2.5}, and lead, were not monitored in the area. No exceedance of the standards for nitrogen dioxide and sulfur dioxide occurred at monitoring locations in Maricopa County during 2007. Monitoring for lead in Maricopa County was discontinued in 1997. There were exceedances of the 24-hour PM_{2.5} standard in Maricopa County, but no exceedance of the annual standard.

Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources (e.g., vehicles), nonroad mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

MSATs are a subset of the 188 air toxics defined by the CAA. MSATs consist of 21 compounds emitted from highway vehicles and nonroad equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other

toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline. Of the 21 MSATs, a subset of six compounds has been designated by the EPA as the priority MSATs. These are acetaldehyde, acrolein, benzene, 1,3-butadiene, diesel particulate matter, and formaldehyde.

- Acetaldehyde is a colorless liquid that is flammable and mixes readily with water. In dilute concentrations, acetaldehyde has a fruity and pleasant odor, which turns pungent at higher concentrations. Acetaldehyde is formed as a product of coffee roasting, tobacco burning, coal refining, waste processing, and of incomplete combustion in fireplaces and motor vehicle engines. It is also formed in the body from the breakdown of ethanol contained in alcoholic beverages. Acetaldehyde causes irritation to the eyes, skin, and respiratory tract and is a probable human carcinogen.
- Acrolein is a nearly clear to yellow liquid that burns easily, is easily volatilized, and has a disagreeable odor. Acrolein can be formed from the breakdown of certain pollutants found in outdoor air or from burning tobacco or gasoline. Exposure to acrolein causes upper respiratory tract irritation and congestion in low concentrations and may cause death in high concentrations. Not enough information is available on acrolein to evaluate its carcinogenicity.
- Benzene is a volatile, colorless, highly flammable liquid that dissolves easily in water and has a sweet odor. Benzene is found in emissions from motor vehicle engines, in combustion products from burning coal and oil, and in the gases resulting from evaporation of gasoline and industrial solvents. Tobacco smoke contains benzene and accounts for nearly half the national exposure to benzene. Benzene exposure causes drowsiness, dizziness, headaches, unconsciousness, vomiting, convulsions, and irritation to the eyes, skin, and upper respiratory tract. Benzene is a known human carcinogen. Chronic exposure to benzene causes blood disorders and chromosomal aberrations.
- 1,3-butadiene is a colorless gas with a mild, gasoline-like odor. Major sources of airborne 1,3-butadiene include combustion byproducts from motor vehicle engines, manufacturing, and other processes; forest fires; and cigarette smoking. Exposure to 1,3-butadiene causes irritation of the eyes, nasal passages, throat, and lungs in low concentrations and blurred vision, fatigue, headache, and vertigo in higher concentrations. 1,3-butadiene has recently been reclassified from a probable human carcinogen to a known human carcinogen.
- Diesel particulate matter is a collection of various-sized particles emitted from diesel powered vehicles, including primarily elemental carbon, organic carbon, and sulfate particles, with trace amounts of nitrate, metals, and other particles. Diesel particulate matter of concern for MSAT

analyses are those particles sized 10 microns or smaller. Although particulate matter may be derived from a number of sources, diesel particulate matter by definition is derived exclusively from diesel vehicle exhaust. Exposure to diesel particulate matter results in irritation to the eyes, nose, throat, and lungs, and may exacerbate asthma. Diesel particulate matter is considered a probable human carcinogen.

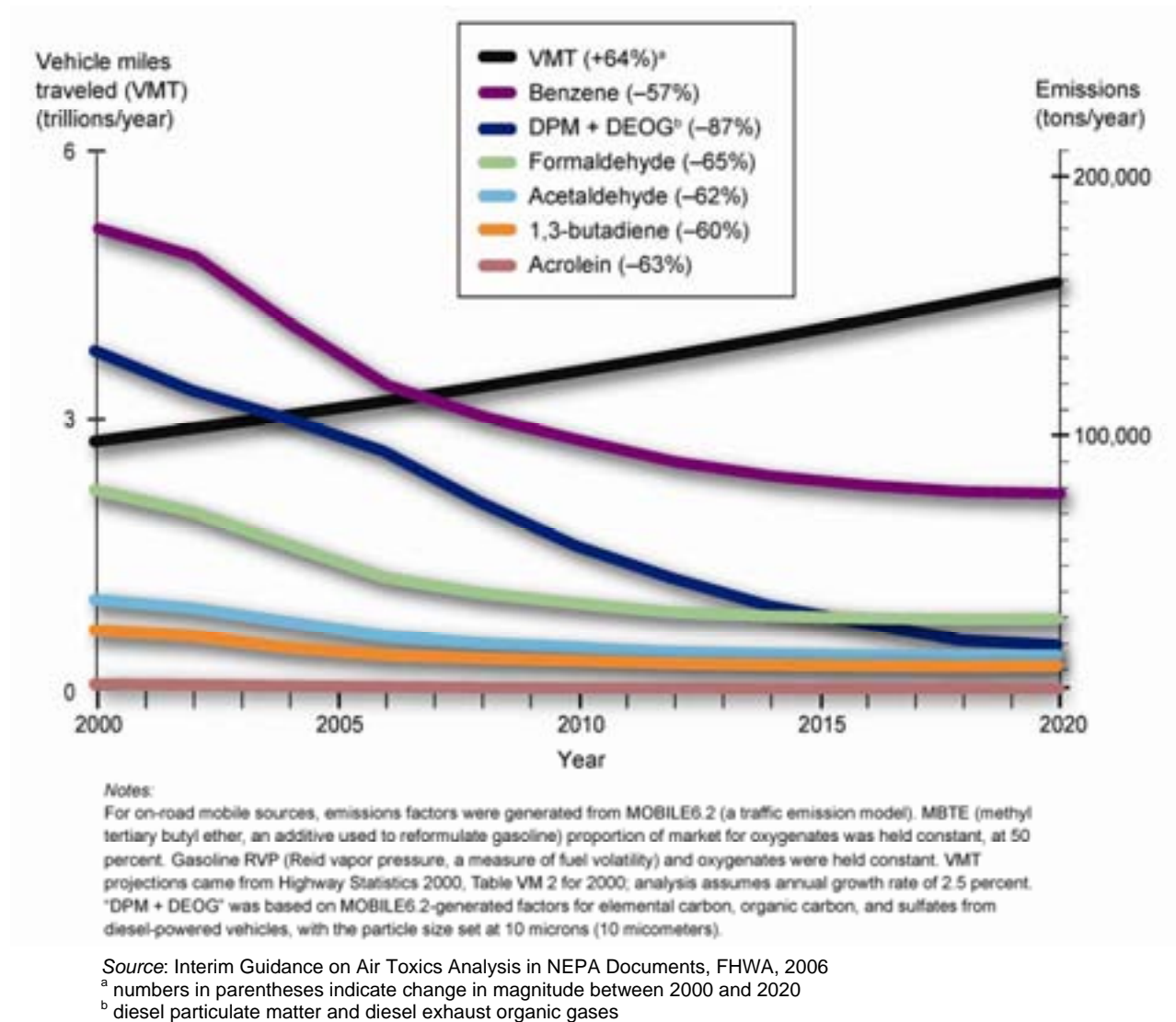
- Formaldehyde is a colorless gas with a pungent, suffocating odor that is readily soluble in water. High levels of formaldehyde have been detected in indoor air, where it is released from various consumer products such as building materials and home furnishings. Major sources of outdoor concentrations of formaldehyde include emissions from power plants, manufacturing facilities, incinerators, and motor vehicle engines. Exposure to formaldehyde results in irritation to the eyes, nose, and throat; coughing; chest pains; and bronchitis. Formaldehyde is classified as a probable human carcinogen.

EPA is the lead federal agency for administering the CAA and has certain responsibilities regarding the health effects of MSATs. EPA issued a final rule in the Federal Register on the “Control of Emissions of Hazardous Air Pollutants from Mobile Sources” on March 29, 2001. This rule was issued under the authority in Section 202 of the CAA. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including:

- a reformulated gasoline program
- national low emission vehicle standards
- Tier 2 motor vehicle emissions standards
- gasoline sulfur control requirements
- proposed heavy-duty engine and vehicle standards
- on-highway diesel fuel sulfur control requirements

Between 2000 and 2020, FHWA projects that even with a 64 percent increase in vehicle miles traveled (VMT), these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, acrolein, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel particulate matter emissions by 87 percent, as shown in Figure 4-5, on page 107.

Figure 4-5. U.S. annual vehicle miles traveled (VMT) vs. mobile source air toxics emissions, 2000–2020



In February 2007, EPA issued a final rule to reduce hazardous air pollutants from mobile sources. The final standards will lower emissions of benzene and other air toxics in three ways: 1) by lowering the benzene content in gasoline, 2) by reducing exhaust emissions from passenger vehicles operated at cold temperatures, and 3) by reducing emissions that evaporate from, and permeate through, portable fuel containers.

Under this rule, EPA is requiring that, beginning in 2011, refiners must meet an annual average gasoline benzene content standard of 0.62 percent by volume on all gasoline (the national benzene content of gasoline today is about 1.0 percent by volume). In addition, EPA is adopting new standards to reduce non-methane hydrocarbon exhaust emissions from new gasoline-fueled

passenger vehicles at colder temperatures below 75°F. Non-methane hydrocarbons include many mobile source air toxics, such as benzene. Finally, the February 2007 rule establishes standards that will limit hydrocarbon emissions that evaporate or permeate through portable fuel containers such as gas cans.

EPA expects that the new fuel benzene standard and hydrocarbon standards for vehicles and gas cans will together reduce total emissions of mobile source air toxics by 330,000 tons in 2030, including 61,000 tons of benzene. As a result of this rule, new passenger vehicles will emit 45 percent less benzene, gas cans will emit 78 percent less benzene, and gasoline will have 38 percent less benzene overall. In addition, the hydrocarbon reductions from the vehicle and gas can standards will reduce volatile organic compound emissions (which are precursors to ozone and can be precursors to PM_{2.5}) by over 1 million tons in 2030. The vehicle standards will reduce direct PM_{2.5} emissions by 19,000 tons in 2030 and could also reduce secondary formation of PM_{2.5}. Once the regulation is fully implemented, EPA estimates that these particulate matter reductions will prevent nearly 900 premature deaths annually.

2. Environmental Consequences

Carbon Monoxide

The air quality analysis performed to assess impacts from the proposed improvements focused on vehicular emissions of carbon monoxide. Carbon monoxide is the primary pollutant of vehicular emissions.

Carbon Monoxide Analysis Methodology

A microscale analysis of the roadways was performed using the computer model, CAL3QHC Version 2. This line source air quality model was developed for the EPA Office of Air Quality Planning and Standards (OAQPS) to predict concentrations of inert pollutants, such as carbon monoxide, near highways and arterial streets that result from emissions produced by moving and idling vehicles (EPA 1992). Ambient concentrations of carbon monoxide were estimated for the existing traffic conditions and roadway configurations, for the estimated traffic conditions and roadway configurations during 2030 under the No-Build Alternative, and for the estimated traffic conditions and roadway configurations in 2030 under the Preferred Alternative.

Five interchanges were selected for detailed analysis based on their poor LOS and/or large projected traffic volumes:

- SR 303L and I-10
- SR 303L and Northern Avenue
- SR 303L and Northern Parkway
- SR 303L and Bell Road
- SR 303L and US 60

Predicted maximum 1-hour concentrations of carbon monoxide were calculated for locations on the existing and proposed R/W for the existing traffic conditions and roadway configurations, for the estimated traffic conditions and roadway configurations in 2030 under the No-Build Alternative, and for the estimated traffic conditions and roadway configurations in 2030 under the Preferred Alternative.

For the existing conditions in 2007, the highest predicted maximum 1-hour concentration of carbon monoxide was 4.4 parts per million (ppm). Generally, the predicted maximum 1-hour concentrations for the existing configuration ranged between 2.0 and 4.0 ppm. None of the predicted concentrations would exceed federal or state standards.

Carbon Monoxide Analysis Results for Preferred Alternative

Predicted maximum 1-hour and 8-hour concentrations for 2030 under the Preferred Alternative generally decreased at those receptors along I-10. Receptors along SR 303L generally experienced a small increase in predicted concentrations. This is attributable to the increase in traffic volumes projected for the 2030 Preferred Alternative scenario. Those receptors adjacent to the intersection of SR 303L and US 60 exhibited decreased concentrations with the proposed improved intersection. None of the predicted 1-hour or 8-hour concentrations would approach or exceed federal and state standards.

The proposed improvements to SR 303L would provide a high-capacity link between I-10 and US 60 and reduce travel time and traffic congestion on arterial streets in the area. The net effect is expected to reduce the regional impact on air quality. This is demonstrated in the *2007 MAG Conformity Analysis* (MAG 2007a), which concluded that the collective projects in the *FY 2008–2012 Transportation Improvement Program* (MAG 2007b), including the proposed improvements to SR 303L, conform to the SIPs for carbon monoxide, ozone, and PM₁₀.

Potential impacts from other criteria pollutants associated with vehicular emissions cannot be quantified until analytical procedures have been developed and approved by EPA and FHWA. Sulfur dioxide, nitrogen dioxide, and lead do not exceed the NAAQS in Maricopa County and are not expected to exceed the NAAQS in the Study Area.

Short-term impacts on ambient levels of carbon monoxide may occur during construction because of the interruption of normal traffic flow. Efforts should be made to reduce traffic back-ups, especially during the peak hours of travel.

Carbon Monoxide Analysis Results for No-Build Alternative

Under the 2030 No-Build Alternative, maximum predicted 1-hour concentrations of carbon monoxide generally increased from those obtained for the current configuration (2007). This is attributable to the increase in traffic volumes projected for 2030, offsetting the reduction in the emission factors for 2030. The highest predicted maximum 1-hour concentration of carbon monoxide was 9.0 ppm—this was estimated for a receptor located near the intersection of US 60 and SR 303L. Other receptors near the intersection also had high predicted concentrations. Generally, the predicted maximum 1-hour concentrations for the No-Build Alternative were between 2.0 ppm and 7.0 ppm. None of the predicted 1-hour or 8-hour concentrations approach or exceed federal and state standards.

Particulate Matter

Particulate matter refers to solid or liquid particles suspended in the air that may be composed of acids, organic chemicals, metals, soil, or dust particles. Particle sizes range from those large enough to be seen as smoke or haze to those that act as a gas and can only be seen through an electron microscope. PM_{2.5} sources include fuel combustion, power plants, and diesel vehicles. PM₁₀ sources include fugitive dust from unstable or disturbed dirt surfaces, vehicle travel on unpaved roads, crushing and grinding operations, and open burning. Fugitive dust sources in Maricopa County are the largest contributors to the nonattainment of the PM₁₀ standard; Maricopa County is in attainment for PM_{2.5}.

EPA has not yet released modeling guidance for performing quantitative PM_{2.5} and PM₁₀ hot-spot analyses for project-level transportation projects, and such analyses are not currently required under 40 C.F.R. 93.123(b)(4). Transportation projects that are within nonattainment or maintenance areas and are not exempt require a qualitative analysis that “must document that no new local PM₁₀ violations will be created and the severity or number of existing violations will not be increased as a result of the project” (FHWA 2001).

In March 2006, EPA and FHWA issued a joint guidance document on performing hot-spot analyses in PM_{2.5} and PM₁₀ nonattainment and maintenance areas that superseded the previous guidance document of 2001. Projects of “air quality concern,” as defined by 40 C.F.R. 93.123(b)(1), require a hot-spot analysis. The methodology may involve comparing the project area with an area possessing similar characteristics, reviewing findings from air quality studies that may have been performed, or conducting other qualitative approaches.

The proposed project is considered a project of “air quality concern” for PM₁₀ as defined by 40 C.F.R. 93.123(b)(1)(i/ii). The PM₁₀ qualitative analysis for this project examined the areas that may be affected by the proposed improvements to SR 303L.

Particulate Matter Analysis Methodology

The qualitative analysis of the potential impacts associated with the proposed improvements began with a review of future traffic conditions on the affected roadways. ADT volumes, the percentage of trucks, and the LOS were reviewed. All truck traffic was assumed to consist of diesel trucks because these data were not available.

Those roadway segments and/or intersections with the worst-case traffic scenario for the build conditions in 2015 and 2030 are summarized in Table 4-9, on this page. The existing conditions (2006) are included for comparison.

Table 4-9. Worst-case traffic scenarios under the existing and future build conditions

Year and configuration	Intersection or roadway segment	Percentage diesel trucks	Average of ADT^a	LOS^b
2006 existing condition	Multiple segments/interchanges	13–17	15,000	n/a ^c
2015 build condition	Multiple segments ^d	7	100,000	B
2030 build condition	SR 303L ^e /US 60 ^f	7	SR 303L – 150,700 US 60 – 90,000 Total – 240,700	D
2030 build condition	SR 303L/Northern Parkway	7	SR 303L – 138,400 Northern Parkway – 49,200 Total – 187,600	D

^a average daily traffic

^b level of service

^c not available for roadway segments or interchanges

^d level of service not available for specific interchanges

^e State Route 303 Loop

^f United States Route 60

Under the 2015 build condition, the average of the ADT along SR 303L will increase from approximately 15,000 during 2006 to 100,000, while the percentage of trucks on SR 303L will be approximately half of the 2006 value. With the proposed improvements, SR 303L is expected to operate at LOS B or better.

Under the 2030 build condition, the percentage of trucks on SR 303L is expected to remain at the 2015 level with an approximately 50 percent increase in the average ADT. With the proposed improvements, the SR 303L main line is expected to operate at LOS D or better during the morning and evening peak hours and at LOS C or better for the freeway and intersection operations. Only during the evening peak hour at the interchanges at SR 303L and Northern Parkway and SR 303L and US 60 is the LOS expected to be reduced to D.

The SR 303L interchanges at Northern Parkway and US 60 are considered to have the worst-case traffic scenarios associated with the proposed improvements. Of these two interchanges, the interchange at SR 303L and US 60 is projected to have a larger ADT and likely a larger percentage of trucks passing through the intersection than at Northern Parkway because of truck traffic on US 60. Traffic counts taken by MCDOT in 2001 indicated that of the trucks on US 60 northwest of SR 303L, 30 percent use SR 303L and 70 percent continue on US 60 past SR 303L. Based on this review, the interchange at SR 303L and US 60 was selected for further evaluation.

The transportation conformity rule requires that the analysis consider the year of expected peak emissions resulting from the project. Using the EPA-approved emission model MOBILE6.2, emission factors for PM₁₀ in grams per vehicle mile traveled were calculated for 2006, 2015, and 2030. The emission factor decreased by approximately 40 percent between 2006 and 2015 and by approximately 50 percent between 2006 and 2030; the reduction between 2015 and 2030 was approximately 10 percent.

The total emissions associated with the project in each year will depend on both the emission factor and the VMT. The emission factor may decrease in future years, but the total emissions during 2030 will increase over those of 2015 because of the large increase in the ADT and corresponding VMT.

For the 2007 *MAG Conformity Analysis*, emissions of PM₁₀ were estimated for 2009, 2015, 2019, and 2028. The applicable conformity test for PM₁₀ is the emission budget test, using the 2006 emissions budget established in the Revised 1999 Serious Area Particulate Plan for PM₁₀. Results of the analysis indicated that the total vehicle-related emissions associated with the implementation of the *MAG Transportation Improvement Program* and RTP for the years of analysis are projected to be less than the 2006 emission budget and are, therefore, in conformity.

Based on the projected ADTs, the worst-case LOS, and the results of the PM₁₀ conformity analysis, the SR 303L and US 60 traffic interchange during 2030 was selected for a qualitative analysis of PM₁₀ impacts. The analysis was a comparative approach that reviewed ambient concentrations of PM₁₀ at various locations in the greater Phoenix metropolitan area. The analysis included vehicle-related emissions such as tailpipe exhaust, brake wear particles, tire wear particles, and reentrained road dust. Emissions from construction activities were also included in the analysis. Of the 14 MCAQD PM₁₀ monitoring sites in Maricopa County, 6 were selected for review and discussion. These sites were selected to represent urban areas adjacent to freeways, urban areas removed from freeways, and rural areas. The selected sites, ambient concentrations of PM₁₀ during 2006, nearest roadway, traffic volumes, and diesel truck percentages are presented in Table 4-10, on page 114.

A review of the monitoring data suggests that those locations that generally have the highest ambient concentrations of PM₁₀ are in industrial, mining, or agricultural areas. The Buckeye site—near the intersection of MC 85 and SR 85—is situated in a rural area adjacent to agricultural operations. This location exceeded the 24-hour PM₁₀ standard on three occasions during 2006; the annual average is below the annual standard.

The Durango Complex site—near the intersection of 27th Avenue and Durango Street—is situated in a mixture of land uses, including residential, industrial, open desert, dry riverbed, and landfill operations. The West 43rd Avenue site—near the intersection of 43rd Avenue and Broadway Road—is surrounded by sand and gravel operations, automobile and metal recycling operations, landfills, paved and unpaved haul roads, and cement casting facilities. The 24-hour PM₁₀ standard has been exceeded on 27 occasions at these two locations, and both have exceeded the annual standard. Both locations have experienced exceptional events, which typically consist of weather-related exceedances caused by wind-blown dust.

Those locations that are adjacent to a freeway typically have ambient concentrations within the standards. The Central Phoenix site—near 19th and Roosevelt streets—has been in operation for over 40 years and provides data representative of a high-population, high-density area near three major freeways. Ambient concentrations of PM₁₀ were below both the 24-hour and annual standards.

The Greenwood site—near 27th Avenue and I-10—is within 200 feet of I-10 and is surrounded by a mix of residential, commercial, and light industrial land uses. This location had one exceedance of the 24-hour standard in 2006; this value was identified as an exceptional event. The second maximum concentration was within the standard, as was the annual concentration.

Table 4-10. PM₁₀ concentrations and roadway characteristics in urban and rural areas of Maricopa County in 2006

Monitoring site and location	PM ₁₀ concentrations (µg/m ³)			Number of exceedances	Nearest roadway	Distance from roadway	Average of ADT ^a	Percentage diesel trucks
	Maximum 24-hour	Second maximum 24-hour	Annual average					
Urban locations adjacent to freeways (less than or equal to 0.5 mile)								
Central Phoenix (19th and Roosevelt streets)	134	99	42.0	0	I-10 ^b	0.25 mile	291,000	7–8
					SR 51 ^c	0.75 mile	168,000	7–8
					SR 202L ^d	0.75 mile	116,000	7–8
Greenwood (27th Avenue and I-10)	166 ^e	141	51.7	1	I-10	200 feet	230,000	8–9
					I-17 ^f	0.5 mile	122,000	7–8
West Chandler (Ellis Street and Frye Road)	77	68	33.3	0	SR 202L	0.5 mile	97,000	3
					SR 101L ^g	0.5 mile	95,300	3
Urban locations removed from freeways (greater than 0.5 mile)								
Durango Complex (27th Avenue and Durango Street)	240 ^e	183	69.2	9	I-17	0.75 mile	119,000	7–8
West 43rd Avenue (43rd Avenue and Broadway Road)	260 ^e	204	79.9	18	I-17	2.5 miles	119,000	7–8
Rural locations								
Buckeye (MC 85 ^h and SR 85 ⁱ)	272	192	53.2	3	n/a ^j	n/a	n/a	n/a

Source: Maricopa County Air Quality Department, 2007

^a average daily traffic

^b Interstate 10

^c State Route 51

^d State Route 202 Loop

^e exceptional event

^f Interstate 17

^g State Route 101 Loop

^h Maricopa County Route 85

ⁱ State Route 85

^j not applicable

The West Chandler site—near Ellis Street and Frye Road—is situated primarily in a residential area with some agricultural and industrial land uses nearby. Ambient concentrations at this location were well below 24-hour and annual standards.

Particulate Matter Analysis Results

Of the monitoring locations reviewed, the Central Phoenix and Greenwood site characteristics most closely resemble those characteristics projected for the SR 303L and US 60 interchange area in 2030. Based on the review of these sites and the projected characteristics of the SR 303L and US 60 area, it is unlikely that the proposed improvements to SR 303L would cause or contribute to an exceedance of the PM₁₀ standards. This conclusion is based on the following reasons:

- Diesel exhaust is not a major contributor to ambient concentrations of PM₁₀.
- Fugitive dust sources in Maricopa County are the largest contributors to ambient concentrations of PM₁₀. Fugitive dust emissions may be reduced as the area changes from an agricultural to an urban and suburban area.
- The Study Area is a considerable distance from those locations with high ambient concentrations and major PM₁₀ sources.
- The proposed improvements will provide a high-capacity link between I-10 and US 60 and reduce travel time and traffic congestion on arterial streets in the area.
- The removal of signalized intersections and stop signs on the SR 303L main line will reduce truck idling time and emissions that occur during acceleration after each stop.
- The emission factor for PM₁₀ in 2030 is projected to be approximately half of the 2006 value.
- Ambient concentrations of PM₁₀ measured in the area are well below the NAAQS.
- The impacts from emissions associated with the LOS D projected for the evening peak traffic volumes may be reduced as a result of improved dispersion conditions in the afternoon.

Short-term impacts on particulate matter levels may occur during the construction phase, but these may be reduced through the use of watering or other dust-control measures to ensure compliance with MCAQD Rule 310 and other appropriate federal, state, and local rules or ordinances, including the MAG Uniform Standard Specifications and Details.

The anticipated net effect of the proposed improvements is to reduce the regional impacts on air quality from those that would occur if the improvements to SR 303L were not completed. This conformity determination meets all of the applicable CAA Section 176(c) requirements for federally funded or approved transportation projects. Specifically, the requirements for particulate matter hot-spot analysis are codified at 40 C.F.R. 93.116 and 93.123. By meeting these regulatory requirements, as well as other requirements in the conformity regulations, this conformity determination demonstrates compliance with the requirements of CAA Section 176(a)(1).

Under the No-Build Alternative, particulate matter levels would be unlikely to exceed the standards because much of the Study Area is expected to change from an agricultural area to an urban and suburban area. Fugitive dust sources in Maricopa County are the largest contributors to ambient concentrations of PM₁₀, but those sources would be reduced with ongoing urban development.

Mobile Source Air Toxics

Recent FHWA guidance requires a quantitative analysis (Level 3) for MSATs on large projects with high expected traffic volumes, such as the proposed SR 303L improvements.

Mobile Source Air Toxics Analysis Methodology

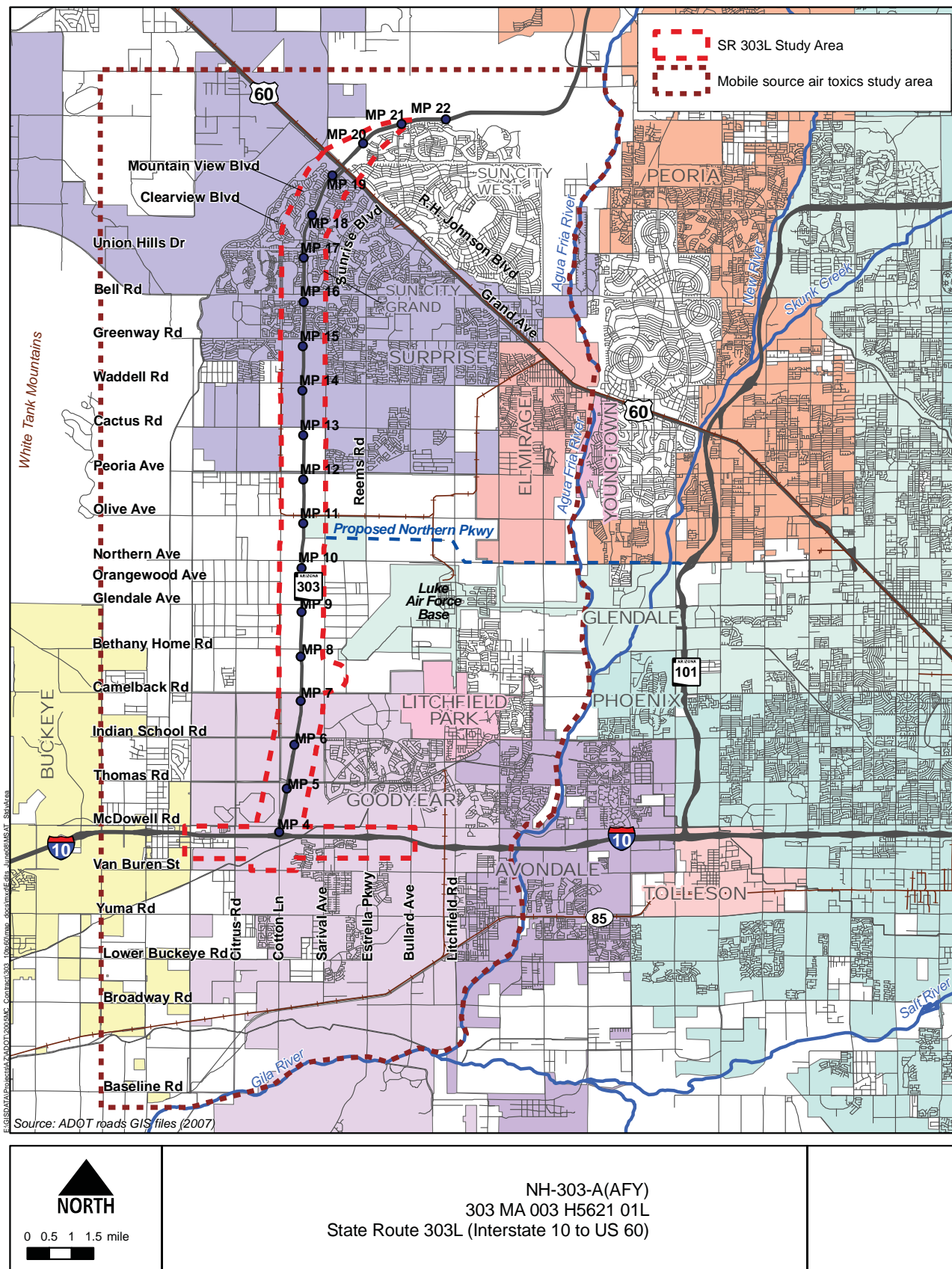
The analysis consisted of a multiple-step process to identify the affected transportation network, calculate vehicle miles traveled, predict MSAT emission factors, and compute total MSAT emissions.

Identify the Affected Transportation Network. The MSAT study area selected for analysis is comprised of the roadway network that is expected to be influenced by the construction of the proposed SR 303L improvements. The northern boundary of the MSAT study area is Happy Valley Road. The southern boundary is the Gila River. The western boundary is the Tuthill Road/203rd Avenue alignment. The eastern boundary is the Agua Fria River. The study area encompasses approximately 220 square miles. Figure 4-6, on page 117, shows the MSAT study area.

A spreadsheet was created using traffic data from the MAG traffic model. The spreadsheet contained 2030 traffic information on nearly 1,800 roadway segments within the MSAT study area, including a unique segment identification number, segment length, number of lanes, ADT volume, functional classification, travel time, and average speeds. Traffic data for the existing year were not available from MAG.

Because the goal of the MSAT analysis was to demonstrate the effects of the proposed project on MSAT quantities, any roadway segment with an increase or decrease in ADT of less than 5 percent between the 2030 No-Build Alternative and 2030 Preferred Alternative conditions was deleted from the analysis. More than 1,600 roadway segments remained in the spreadsheet for analysis.

Figure 4-6. Study area for mobile source air toxic analysis



Calculate Vehicle Miles Traveled. The VMT per day was calculated for each roadway segment by multiplying the roadway segment length by the ADT for that segment. The VMT for all roadway segments was summed for both the future No-Build Alternative (2030) and future Preferred Alternative (2030) conditions. The data showed a projected increase of almost 17 percent between the No-Build Alternative and Preferred Alternative conditions. The future Preferred Alternative condition is projected to have more than 12 million VMT per day in the MSAT study area.

Predict MSAT Emission Factors. The toxic module of the MOBILE6.2 emission factor model was used to generate future emission factors for each of the six priority MSATs. Input files for the model used data from the MAG air quality section and recommendations from EPA and FHWA. Speed-dependent emission factors were generated for the six priority MSATs using speed bins in 5 mph increments up to 65 mph. The emission factors were assigned to each roadway segment in the spreadsheet based on the projected speed of traffic on the segment for the two scenarios.

Compute Total MSAT Emissions. MSAT emissions were calculated for each roadway segment by multiplying the VMT per day by the speed-dependent emission factor. The emissions per day for each roadway, in milligrams per day, were then converted into tons per year. The emissions for all roadway segments were summed, resulting in the total emissions in tons per year for each of the six priority MSAT pollutants under the two scenarios.

Analysis Results. Results of the MSAT analysis are presented in Table 4-11, on this page. Comparisons are made between the future No-Build Alternative (2030) and future Preferred Alternative (2030) scenarios to show the effect of the proposed SR 303L project on future MSAT quantities in the MSAT study area. The change in daily VMT is also shown.

Table 4-11. Predicted MSAT emissions (in tons per year)

Pollutant	2030 No-Build Alternative	2030 Preferred Alternative	Change (%)
Acetaldehyde	5.44	5.65	+4
Acrolein	0.554	0.566	+2
Benzene	14.9	16.1	+8
1,3-butadiene	2.03	2.18	+7
Diesel particulate matter	5.78	6.76	+17
Formaldehyde	12.5	12.8	+3
Daily vehicle miles traveled	10,271,497	12,008,039	+17

Note: The existing year values are not shown because traffic data for the existing year were not available from the Maricopa Association of Governments.

The comparisons show that between the future No-Build Alternative condition and future Preferred Alternative condition, the VMT increases approximately 17 percent, while five of the six priority MSAT pollutants increase only 2 percent to 8 percent. The sixth MSAT pollutant, diesel particulate matter, is projected to increase 17 percent between the future No-Build Alternative condition and the future Preferred Alternative condition. The emission factors for diesel particulate matter are not speed-dependent like the other MSAT pollutants, so the increase in diesel particulate matter with the project is directly related to the increase in VMT associated with the project. The smaller increases in the other five MSAT pollutants are related to a reduction in traffic congestion throughout the transportation network as a result of the project. Reduced traffic congestion results in increased travel speeds, which results in more efficient vehicle operations and lower emissions.

Although the existing year VMT was not available, a qualitative comparison can be drawn from a similar, nearby project. The SR 801 study area is located approximately 3 miles south of I-10. The proposed SR 801 freeway is similar in design to SR 303L and located in the same general area. The MSAT analysis completed for the SR 801 study showed a VMT increase of 326 percent throughout the study area between 2004 and 2030, while five of the six MSAT pollutants increased only 32 percent to 95 percent. The sixth MSAT pollutant, diesel particulate matter, actually decreased 79 percent from 2004 to 2030, representing the dramatic reductions in vehicle emissions of diesel particulate matter previously discussed.

3. Mitigation Measures

- In accordance with Maricopa County Rule 310, “Fugitive Dust Sources,” an earthmoving permit would be obtained and a fugitive dust control plan would be prepared and submitted to Maricopa County for each construction site.
- To minimize emissions from idling and slow-moving traffic in the construction zone, traffic control would be implemented in accordance with Part VI and the Arizona Supplement to Part VI of the *Manual on Uniform Traffic Control Devices for Streets and Highways*, 2003 edition, published by FHWA (2003a), including any revisions or additions and/or associated provisions in the project plans, as determined by ADOT’s Traffic Design Section during final design. Disruption to traffic would be limited, especially during peak travel periods.

4. Conclusion

The long-term impacts associated with the proposed improvements to SR 303L are not expected to cause or contribute to an exceedance of air quality standards. Results of the microscale modeling completed for this study indicate that impacts to ambient 1-hour average concentrations of carbon

monoxide are predicted to generally be less than 2 ppm. Based on a review of selected PM₁₀ monitoring sites in Maricopa County and projected characteristics of the SR 303L and US 60 area, it is unlikely that the proposed SR 303L improvements would cause or contribute to an exceedance of the PM₁₀ standards. Impacts on the remaining criteria pollutants are also expected to be low.

Under the No-Build Alternative, maximum predicted 1-hour concentrations of carbon monoxide generally increased from those obtained for the current configuration (2007). However, none of the predicted 1-hour or 8-hour concentrations approach or exceed federal and state standards.

Particulate matter levels would be unlikely to exceed the standards under the No-Build Alternative because much of the Study Area is expected to change from an agricultural area to an urban and suburban area. Fugitive dust sources in Maricopa County are the largest contributors to ambient concentrations of PM₁₀, but those sources would be reduced with ongoing urban development.

The MSATs analysis revealed that the VMT increases approximately 17 percent between the No-Build Alternative condition and Preferred Alternative condition, while five of the six priority MSAT pollutants increase only 2 to 8 percent. The sixth MSAT pollutant, diesel particulate matter, is projected to increase 17 percent between the future No-Build Alternative condition and the future Preferred Alternative condition. The emission factors for diesel particulate matter are not speed-dependent like the other MSAT pollutants, so the increase in diesel particulate matter with the project is directly related to the increase in VMT associated with the project. The smaller increases in the other five MSAT pollutants are related to a reduction in traffic congestion throughout the transportation network as a result of the project. Reduced traffic congestion results in increased travel speeds, which results in more efficient vehicle operations and lower emissions of pollutants.

Since 1977, federal agencies and metropolitan planning organizations such as MAG have been required by Section 176c of the CAA to ensure that all transportation projects conform to the approved air quality SIP. The CAA amendments enacted in 1990 defined conformity to a SIP as “conformity to a SIP’s purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards (NAAQS)” (*Federal Register*, November 30, 1993). The conformity determinations for federal actions related to transportation projects must meet the requirements of 40 C.F.R. Parts 51 and 93. This proposed project is included in the MAG *FY 2008–2012 Transportation Improvement Program* approved in July 2007. As demonstrated in the *2007 MAG Conformity Analysis*, the projects contained in the *Transportation Improvement Program* conform to the SIP for carbon monoxide, ozone, and PM₁₀.

H. Noise Levels

FHWA and ADOT assess roadway noise levels in terms of a 1-hour equivalent sound level (L_{eq}). The basic unit for measuring sound is the decibel. To assess noise impacts, a weighted curve known as the A-weighted scale has been developed for use in approximating the sensitivity of the average human ear. The base measurement for community and transportation noise is the A-weighted decibel (dBA).

FHWA and ADOT policies determine when noise mitigation measures, such as noise barriers, are appropriate to reduce the noise radiating from a highway to nearby sensitive receivers. A receiver is the location at which noise levels are measured, modeled, and analyzed. Receivers of interest are typically residences, schools, parks, or other noise-sensitive properties. The FHWA *Procedures for Abatement of Highway Traffic Noise and Construction Noise* (23 C.F.R. Part 772) state that a traffic noise impact occurs when the predicted traffic noise levels approach or exceed the sound levels shown in Table 4-12 (on this page) or when the predicted traffic noise levels substantially exceed the existing noise levels.

Table 4-12. Noise abatement criteria

Activity category	dBA L_{Aeq1h} ^a	Description of land use
A	57 (exterior)	Land on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	67 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals
C	72 (exterior)	Developed lands, properties, or activities not included in Categories A or B above
D	no criterion	Undeveloped land
E	52 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums

Source: 23 C.F.R. Part 772

^a the 1-hour equivalent loudness in A-weighted decibels, which is the logarithmic average of noise over a 1-hour period

The ADOT *Noise Abatement Policy*, issued December 5, 2005, defines “approach” as 3 decibels below the FHWA noise abatement criteria (NAC) and “substantially exceeding the existing noise levels” as an increase of 15 dBA or more above the existing noise levels (ADOT 2005b). In assessing the mitigation requirements along SR 303L, an hourly L_{eq} maximum of 64 dBA was used for Category B activities, as well as a 15 dBA increase in the hourly L_{eq} , to determine whether a noise impact would occur that would require mitigation measures to be considered.

According to FHWA and ADOT guidelines, noise abatement should be considered if either of the criteria described previously are exceeded. However, noise abatement measures must be reasonable, feasible, and desired by the affected individuals. Feasibility deals primarily with engineering considerations (e.g., Can a barrier be built given the topography of the location? Can a substantial noise reduction be achieved given certain access, drainage, safety, or maintenance requirements? Are other noise sources present in the area?). According to ADOT, the reasonableness criteria would include, but would not be limited to, the amount of noise reduction provided, cost of noise abatement measures, views of affected residents, barrier height limitations, and aesthetic impacts.

1. Existing Conditions

Existing noise level readings were taken at 10 monitoring sites within the Study Area during a preliminary noise study completed in April 2005 (ADOT 2005c). The noise monitoring results and monitoring site descriptions are listed in Table 4-13, on this page.

Table 4-13. Noise monitoring results

Monitoring site	Location	Ambient noise level ^a
M-1	Northeast of SR 303L ^b and US 60 ^c traffic interchange	51
M-2	Southwest of SR 303L and US 60 traffic interchange	55
M-3	East of SR 303L, between Mountain View and Clearview boulevards	49
M-4	East of SR 303L, south of Clearview Boulevard	59
M-5	East of SR 303L, between Clearview Boulevard and Bell Road	60
M-6	East of SR 303L, north of McDowell Road	55
M-7	West of SR 303L, south of I-10 ^d	60
M-8	East of SR 303L, south of I-10	61
M-9	West of SR 303L, north of Van Buren Street	57
M-10	East of SR 303L, north of Van Buren Street	60

^a measured in dBA L_{Aeq1h}

^c United States Route 60

^b State Route 303 Loop

^d Interstate 10

The existing noise levels were recorded at the monitoring sites with a Type I integrating sound level meter. The readings were taken on January 20, 2004, during morning and afternoon peak traffic periods.

The monitoring consisted of 15-minute-long sound level recordings using the integrating sound level meter. The meter was placed approximately 5 feet above the ground of the monitoring site.

The weather conditions during the readings consisted of clear skies, 63°F, 15 percent relative humidity, with a slight breeze averaging from 1 to 3 mph coming from the southwest. These weather conditions had little effect on the transmission of sound energy at the monitoring sites.

The existing noise levels at the monitoring sites throughout the Study Area ranged from a low of 49 dBA L_{Aeq1h} to a high of 61 dBA L_{Aeq1h} . There were no dominant noise sources at any of the monitoring sites because much of the area is sparsely developed. Background noises included traffic noise from SR 303L, I-10, cross streets, and noise from occasional aircraft.

2. Environmental Consequences

Noise levels were evaluated for 143 receivers located along the proposed SR 303L corridor. The receivers were generally located within 2,000 feet of the proposed freeway centerline. The receivers were evaluated for the Preferred Alternative, with the proposed improvements and the future (2030) peak-hour traffic volumes.

Noise levels from existing and future (2030) roadway traffic were analyzed using Traffic Noise Model (TNM) Version 2.5. TNM uses site-specific information, including traffic volume, speed, vehicle classification data, roadway lane configuration, and site acoustical characteristics to predict peak-hour traffic noise at selected receiver locations. Traffic parameters necessary for the TNM were generated from preliminary design files. The program considers characteristics of the path of noise transmitted between the source and the noise receiver by including the effects of intervening barriers, topography, trees, and atmospheric absorption. TNM requires a considerable amount of data regarding the geometry of the roadway, as well as traffic volumes, vehicle mix, and speeds. Detailed output files are available in the complete noise study (ADOT 2007b). The project route was broken into multiple segments within TNM to accommodate areas where the roadway geometry and traffic volumes differ. The receiver locations and potential noise barrier locations are shown in Appendix B, *Noise Receiver Locations and Potential Barriers*.

Preferred Alternative

From a traffic noise perspective, the Preferred Alternative would have the greatest impact on noise-sensitive land uses in the Study Area. This is primarily because of the greater traffic volumes projected and design speeds associated with this alternative.

Predicted future peak-hour noise levels from the proposed SR 303L would range from 60 dBA L_{eq} to 80 dBA L_{eq} at the 143 receivers. The predicted noise levels at 137 of the 143 receivers would

exceed the ADOT mitigation criterion. These 137 affected receivers would be eligible for noise abatement consideration.

Temporary noise impacts may be experienced during the construction of any part of the proposed improvements. The quantification of such impacts is difficult without data on this project's construction schedule and equipment use. Therefore, certain assumptions were made to predict the approximate noise level at the R/W line. These predictions are based on the loudest equipment expected to be used during each construction stage of a typical roadway project. Data on construction equipment noise are available from USDOT's *Highway Construction Noise: Measurement, Prediction, and Mitigation* (FHWA 1977).

An analysis was conducted during a freeway construction project in Arizona that assessed the collective impact of construction noise. The noise levels were calculated at the R/W line. The distance between the R/W line and the construction activity was estimated based on the type of work being performed.

The results of the preliminary estimates, shown in Table 4-14, on this page, indicate that sensitive receivers could be affected by construction noise if the receivers were immediately adjacent to the R/W. The highest noise levels would occur during the grading/earthwork phase of construction.

Table 4-14. Construction equipment noise

Phase	Equipment	Equipment L_{\max}^a	Number of feet to right-of-way	L_{\max} at right-of-way
Site clearing	Dozer	84	50	88
	Backhoe	85	50	
Grading/earthwork	Scraper	92	75	93
	Grader	91	75	
Foundation	Backhoe	85	100	85
	Loader	84	100	
Base preparation	Compressor	85	100	85
	Dozer	84	100	

^a maximum instantaneous sound level in decibels

No-Build Alternative

Noise impacts from the No-Build Alternative would be caused by traffic along the existing two-lane SR 303L roadway, as well as arterial streets throughout the area. Because traffic volumes and noise levels would be lower along the SR 303L roadway and would, instead, be shifted to other roadways

in the area, noise impacts would be shifted to receivers throughout the area, many of which may be other than those modeled for the Preferred Alternative. Based on projected growth throughout the region, traffic congestion would increase under this alternative, which would reduce travel speeds, thereby reducing traffic noise levels. As such, the No-Build Alternative would generally result in lower noise levels at the selected receivers than would the Preferred Alternative, but would result in higher noise levels at other locations, such as along arterial streets. Under the No-Build Alternative, noise would be generated by traffic on neighborhood and arterial streets and by nontraffic noise sources and other general neighborhood activity. Therefore, it is difficult to predict noise levels from the No-Build Alternative.

3. Mitigation Measures

Noise reduction strategies typically consist of placing a noise barrier, such as a concrete or masonry wall or an earthen berm, along the main line or at the R/W line of a transportation corridor. Noise barriers are usually the most feasible and cost-effective mitigation strategy for highway noise.

Appendix B, *Noise Receiver Locations and Potential Barriers*, shows the proposed locations of noise barriers for the 137 receivers that would be affected under the Preferred Alternative. A final noise analysis would be conducted during the final design stage and would determine the precise location and height of noise abatement walls.

- Additional noise analyses would be conducted during the final design phase to determine the exact number, location, and height of noise barriers required to mitigate noise impacts in accordance with ADOT's *Noise Abatement Policy* (2005b).

4. Conclusion

From a traffic noise perspective, the Preferred Alternative would have the greatest impact on noise-sensitive land uses in the Study Area. This is primarily because of the greater traffic volumes projected and design speeds associated with this alternative. The predicted noise levels at 137 of the 143 receivers would exceed the ADOT mitigation criterion. These 137 affected receivers would be eligible for noise abatement consideration.

Noise impacts from the No-Build Alternative would be caused by traffic along the existing two-lane SR 303L roadway, as well as arterial streets throughout the area. Because traffic volumes and noise levels would be lower along the SR 303L roadway and would, instead, be shifted to other roadways in the area, noise impacts would be shifted to receivers throughout the area, many of which may be other than those modeled for the Preferred Alternative. The No-Build Alternative would generally

result in lower noise levels at the selected receivers than would the Preferred Alternative, but would result in higher noise levels at other locations, such as along arterial streets.

The noise technical study completed for this Draft EA analyzed possible noise impacts and potential mitigation measures associated with the proposed improvements to SR 303L. ADOT will continue to address possible noise impacts and potential mitigation measures associated with design changes to the connector ramps at the SR 303L and US 60 traffic interchange.

I. Hazardous Materials

This section describes the assessment of hazardous materials that was conducted for the SR 303L study.

1. Existing Conditions

An initial site assessment (ISA), including a database search, was prepared for the Study Area to determine the potential for the presence of recognized environmental conditions attributable to previous or existing land use activities. Two reports were prepared: *Initial Site Assessment SR 303L Corridor I-10 to US 60* (ADOT 2002) and *Hazardous Materials Inventory Loop 303/White Tanks ADMP Update* (ADOT 2003).

The ISA process has revealed a number of potential low- or moderate-risk sites located within 1 mile of the Study Area. Few high-risk sites that warrant additional environmental investigation were detected. A high-risk determination results from the type of business operations formerly or currently performed at the site, the occurrence of aboveground and/or underground storage tanks, and the presence of businesses that use or produce a regulated toxic material at the site or have a violation listed in an environmental database. The two reports generated for this study list a total of 12 high-risk sites.

The 2002 report notes that one site is near SR 303L—a former plant nursery at Northern Avenue and SR 303L (0.25 mile west of SR 303L). The site has several aboveground storage tanks and debris on-site. Based on a preliminary identification of R/W needs for the proposed improvements, no R/W would be acquired from the former nursery site. The site does not appear in any database.

Although numerous well sites were identified, they do not pose a high risk of environmental contamination. Many well sites exhibit mild-to-moderate staining around pumps from lubrication oil overspill. This staining is localized and typically is present on the concrete pump pad and on the surrounding bare soil. This type of surface staining typically does not constitute a recognized environmental condition, as defined by American Society for Testing and Materials' (ASTM) Practice E-1527-05, because the staining is usually of low volume and is not very mobile in subsurface media. No recognized high-risk sites fall within the preliminary R/W needed for the proposed project. Any required well closure would be conducted in accordance with ADWR requirements to properly seal well heads from potential contaminants.

The 2003 report covers the entire Loop 303/White Tanks ADMP study area. None of the 11 high-risk sites noted in the *Hazardous Materials Inventory Loop 303/White Tank ADMP Update* is located within 0.5 mile of the proposed construction area.

A field reconnaissance was performed in June 2008 for the portion of the Study Area north of US 60, and no sites of concern were identified. Development along SR 303L between MP 19.0 and MP 21.5 consists of undeveloped land and residential properties. No pits, ponds, lagoons, or staining were identified.

2. Environmental Consequences

Preferred Alternative

No substantive presence of hazardous materials or suspected hazardous materials activities occurs within the project corridor based on existing environmental database reviews and nonintrusive visual inspections. Because R/W acquisition or construction would not occur for several years, and because the area is experiencing rapid development that might include businesses with hazardous materials issues, additional review would be needed to determine whether this conclusion is still valid. The corridor would need to be reevaluated prior to R/W acquisition. A new ISA, prepared in conformance with the most current version of the ASTM standards (E-1527 series of standards), would be prepared. Well sites to be relocated would be revisited to evaluate the extent of soil staining present and determine appropriate disposal, as needed.

During final design, ADOT would coordinate with well owners regarding irrigation well closure or relocation. Some wells may be relocated out of the R/W, requiring coordination with ADWR and an Aquifer Protection Permit (APP) if relocated more than 660 feet from the closed well. Well closure would occur in accordance with ADWR requirements for well-head protection (see Part 4, Section B, *Water Resources*, on page 71, for more information about groundwater wells).

No-Build Alternative

If the No-Build Alternative were selected, no impacts to the proposed SR 303L improvements from hazardous materials sites would be anticipated. However, continuing urban development in the Study Area could be affected by hazardous materials sites.

3. Mitigation Measures

- During final design, the ADOT project manager would contact the ADOT Environmental Planning Group's hazardous materials coordinator at (602) 712-7767 to determine the need for additional site assessment. The project corridor would need to be reevaluated prior to R/W acquisition. A new ISA, prepared in conformance with the most current version of the ASTM standards (E-1527 series of standards), would be prepared.
- District personnel, in association with the contractor, would complete the National Emissions Standard for Hazardous Air Pollutants (NESHAP) documentation and submit it to the appropriate ADOT office, as determined by the hazardous materials coordinator, for review 5 working days prior to being submitted to the regulatory agencies (See ADOT policy SAF-6.01, February 23, 2004).
- The contractor, in association with the ADOT Engineer, would file a NESHAP notification with ADEQ and/or any other appropriate delegated agency as noted on the NESHAP form for the project's county or as determined by the hazardous materials coordinator, at least 10 working days prior to the modification, demolition, or removal of regulated amounts of asbestos containing material associated with structures in the project area.

4. Conclusion

No adverse impacts related to hazardous materials are expected as a result of selection of either the Preferred Alternative or No-Build Alternative. Under the Preferred Alternative, a new ISA would be completed during the final design stage, and the ADOT Project Manager would coordinate with the ADOT Environmental Planning Group hazardous materials coordinator to determine the need for additional site assessment.

If the No-Build Alternative were selected, no impacts to the proposed SR 303L improvements from hazardous materials sites would be anticipated. However, continuing urban development in the Study Area could be affected by hazardous materials sites.

J. Cultural Resources

An assessment of cultural resources was completed for this SR 303L Draft EA to comply with NEPA and the National Historic Preservation Act (NHPA). Section 106 of NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and afford the State Historic Preservation Office (SHPO) and other interested parties the opportunity to comment on such undertakings.

Historic properties include prehistoric and historic districts, sites, buildings, structures, or objects included in or eligible for inclusion in the National Register of Historic Places (NRHP). Historic properties may be eligible for nomination to the NRHP if they possess integrity of location, design, setting, materials, workmanship, feeling, and association, and meet at least one of the following criteria:

- Criterion A – be associated with events that have made a significant contribution to the broad patterns of our history
- Criterion B – be associated with the lives of persons significant in our past
- Criterion C – embody the distinctive characteristics of a type, period, or method of construction; or represent the work of a master; or possess high artistic values; or represent a significant and distinguishable entity whose components may lack individual distinction
- Criterion D – have yielded, or may be likely to yield, information important in prehistory or history

The area of potential effects (APE) for the proposed project includes the current SR 303L R/W from West Van Buren Street (approximately 0.8 mile south of I-10) to the terminus north of US 60 at the North Veterans Drive alignment (roughly 1.7 miles north of US 60) as well as a 0.5-mile buffer on either side of the existing roadway. It also encompasses a 1-mile segment of US 60 between 163rd Avenue and Sentinel Drive and a 5-mile segment of I-10 between Perryville Road and Bullard Avenue, as well as a 0.5 mile buffer around these segments of US 60 and I-10. As the proposed project advances, the project APE may require revisions.

An executed programmatic agreement (PA) regarding treatment of historic properties along SR 303L and the associated roadway drainage system between the Gila River and US 60 was developed among FHWA, SHPO, and ADOT (refer to Appendix D, *Programmatic Agreement*).

1. Existing Conditions

The cultural resources assessment was based primarily on prior records searches conducted for MCDOT along the SR 303L corridor. The results of the record searches were reported in two Class I reports. One report, entitled *A Class I Cultural Resource Inventory of the State Route 303 Loop Corridor from I-10 to US 93 in Maricopa County, Arizona* (Stubing 2001), was prepared by Entranco, Inc. The other report, entitled *A Class I Cultural Resources Inventory of Approximately 11.75 Miles for the State Route 303 Loop Corridor in Maricopa County, Arizona* (Davis et al. 2004), was prepared by Carter & Burgess, Inc. Other cultural resources data included in this section are derived from the AZSITE online database.

Class I Results

The Class I results indicated that, although the majority of the SR 303L R/W has been surveyed, the majority of the APE has not been previously surveyed for cultural resources. Data was unavailable for two previous surveys within the APE: SHPO-2003-2522 and 11-14.BLM. All other previous cultural resources surveys are listed in Table 4-15, beginning on this page.

Table 4-15. Previous cultural resources surveys

Report author	Title	Limits on APE ^a
Adams (1997)	<i>Archaeological Assessment for the Estrella Interim Parkway, North Maricopa County, Arizona</i>	Bullard Avenue alignment to US 60 ^b
Bontrager and Stone (1987)	<i>Cultural Resources Investigations for Two Highway Improvement Projects on Grand Avenue (US 60) between El Mirage and Beardsley Canal</i>	163rd Avenue to R. H. Johnson Boulevard
Curtis (1989)	<i>Archaeological Survey of an Approximately 24-Mile-Long Segment of Grand Avenue (US 60) between El Mirage and Beardsley Canal</i>	163rd Avenue to R. H. Johnson Boulevard
Davis et al. (2004)	<i>A Class I Cultural Resources Inventory of Approximately 11.75 Miles for the State Route 303 Loop Corridor in Maricopa County, Arizona</i>	I-10 ^c to Gila River
Ellis (1999)	<i>A Cultural Resources Survey of 180 Acres, Thomas Road to I-10, Cotton Lane/Loop 303, in Goodyear, Maricopa County, Arizona</i>	I-10 to Thomas Road
Foster et al. (1993)	<i>A Class III Cultural Resources Survey of the Electric Lightwave, Inc., Southwest Fibernet Project Fiber Optic Line Right-of-Way from Las Vegas, Nevada to Phoenix, Arizona</i>	163rd Avenue to R. H. Johnson Boulevard
Hackbarth (1999)	<i>Class II Archaeological Survey of the Greer Ranch, Surprise, Arizona</i>	East side of SR 303L ^d between Peoria and Olive avenues
Hoffman (1988)	<i>Letter report to Ken Kvamme regarding survey along Grand Avenue</i>	Near Deer Valley Road intersection

(continued on next page)

Table 4-15. Previous cultural resources surveys (*continued*)

Report author	Title	Limits on APE^a
Howell (1994)	<i>An Archaeological Survey along a Portion of the Estrella Interim Roadway, Maricopa County, Arizona</i>	North of Deer Valley Road to US 60
Hutira (1998)	<i>An Archaeological Survey of the Northwest Ranch, Maricopa County, Arizona</i>	Van Buren Street intersection
Jackman Jensen (1994)	<i>An Archaeological Assessment of Cultural Resources along US 60 between Mileposts 123.55 and 138.6, Beardsley Road and the Morristown Railroad Overpass, Maricopa County, Arizona</i>	US 60 intersection
Kearns et al (2001)	<i>An Archaeological Survey of Link Three of the AT&T NexGen/Core Project, Arizona and California</i>	South of I-10 intersection (0.35 mile)
Keller (1986)	<i>Final Report for Archaeological Survey of the Mead to Phoenix 500 kV Direct Current Transmission Line Preferred Alternative</i>	US 60 intersection
Larkin and Giacobbe (1998)	<i>A Cultural Resource Assessment for the Arizona Department of Transportation of Ten Locations in the Phoenix District along I-10 at Mileposts 124.70, 133.70, 141.68, 151.18, 157.74, 162.38, and along I-17 at Mileposts 195.93 and 216.00, and along SR 51 at Mileposts 3.32 and 5.57, Maricopa County, Arizona</i>	I-10 intersection
Lindly (2004a)	<i>An Archaeological Survey of the Loop 303 Expressway and Proposed New Northern Avenue Super Street in Maricopa County, Arizona</i>	Proposed realignment to the north of Northern Avenue
Lindly (2004b)	<i>An Archaeological Survey of the Intersection of the Proposed Loop 303 Expressway (Cotton Lane) and Van Buren Road in Southwest Maricopa County, Arizona</i>	Van Buren Street intersection
Lindly (2004c)	<i>An Archaeological Survey of the Proposed Loop 303 Expressway (Cotton Lane) South of Interstate 10 to the Gila River in Southwest Maricopa County, Arizona</i>	I-10 intersection to (just north of) Van Buren Street
Neily (1992)	<i>An Archaeological Survey of 367 Acres near Sun City West, Maricopa County, Arizona</i>	East of Reams Road alignment
Punzmann (1992)	<i>Archaeological Assessment of the Proposed Estrella Freeway Realignment, Sun City West, Maricopa County, Arizona</i>	North of Deer Valley Road alignment (northeast of US 60)
Rodgers (1989)	<i>Archaeological Survey of the Estrella Freeway Interim Roadway (Loop 303) in Metropolitan Phoenix, Arizona</i>	I-10 to US 60
Rodgers (1990)	<i>An Archaeological Survey of Parcel 1 of the Estrella Freeway Interim Roadway (Loop 303) in Metropolitan Phoenix, Arizona</i>	Southwest of Grand Avenue and northeast of Beardsley Road
Rodgers (1991a)	<i>An Archaeological Survey of Parcel 8 of the Estrella Freeway Interim Roadway in Goodyear, Arizona</i>	0.35 mile south of Camelback Road
Rodgers (1991b)	<i>An Archaeological Survey of Parcel 4S of the Estrella Freeway Interim Roadway in North-Central Maricopa County, Arizona</i>	North of Olive Avenue, east of Cotton Lane, 0.5 mile west of Sarival Avenue

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Table 4-15. Previous cultural resources surveys (*continued*)

Report author	Title	Limits on APE ^a
Rogge (2002)	<i>Cultural Resource Survey of the Indian School Road, Northern Avenue, and Olive Avenue Intersections with the Loop 303 Expressway, Maricopa County, Arizona: An Addendum Regarding the Burlington Northern Santa Fe Railroad Spur</i>	Burlington Northern Santa Fe railroad spur to Olive Avenue
Rogge and Chamorro (2001)	<i>Cultural Resource Survey of the Indian School Road, Northern Avenue, and Olive Avenue Intersections with the Loop 303 Expressway, Maricopa County, Arizona</i>	Three intersections: Indian School Road, Northern Avenue, and Olive Avenue
Shaw (1999)	<i>Archaeological Survey Southeast of Waddell, Arizona at the Intersection of Cotton Lane and Cactus Road, Maricopa County, Arizona</i>	West side of Cotton Lane, north side of Cactus Road
Stein et al. (1977)	<i>Archaeological Investigations: Arizona Nuclear Power Project, Salt River Project, Bureau of Land Management and Private Land, Maricopa County, Arizona</i>	Northeast of US 60
Stone (1987)	<i>Supplemental Archaeological Survey for ADOT^e Project SMB-002-2-501 (Grand Avenue)</i>	163rd Avenue to R. H. Johnson Boulevard
Stubing (2001)	<i>A Class I Cultural Resource Inventory of the State Route 303 Loop Corridor from I-10 to US 93^f in Maricopa County, Arizona</i>	I-10 to US 60
Touchin and Brodbeck (2003)	<i>A Cultural Resources Survey along the Interstate 10 Corridor from State Route 85 to the Loop 101 Freeway (Mileposts 112.20 to 134.00), Maricopa County, Arizona</i>	I-10 intersection—2.73 miles east and 2.15 miles west
Unknown	<i>Project Name: Survey of an 800 Acre Parcel NE of Perryville, Maricopa County, Arizona</i>	West side of SR 303L between Thomas and McDowell roads
Webb 1999	<i>Cultural Resources Survey of 11 Proposed Frontage Road Segments and Intersection Re-alignments along US 60, between Mileposts 123.55 and 138.6, in Maricopa County, Arizona</i>	US 60 adjacent to McMicken Dam Outlet Channel
White, Doyel, and Ryan (2002)	<i>A Cultural Resource Survey of Ten Intersections Along the Loop 303 Expressway, Maricopa County, Arizona</i>	Ten intersections: Bell Road, Greenway Road, Waddell Road, Cactus Road, Peoria Road, Glendale Avenue, Bethany Home Road, Camelback Road, Thomas Road, McDowell Road

^a area of potential effect^b United States Route 60^c Interstate 10^d State Route 303 Loop^e Arizona Department of Transportation^f United States Route 93

As a result of the various surveys, 14 sites—4 prehistoric and 10 historic—have been previously documented in the APE. All 4 prehistoric sites consist of artifact scatters; 2 of those sites also contain a feature. The historic sites consist of a highway, railroad, homestead, canal, road, and 5 artifact scatters. The aforementioned sites are summarized in Table 4-16, on page 134.

Table 4-16. Prehistoric and historic sites identified within the SR 303L area of potential effects

Designation Other names and numbers	Property type	Location	NRHP^a eligibility	Proposed treatment
AZ V:2:101 (ASM) US 60/Grand Avenue; AZ CC:2:174/US 70; AZ I:3:10/US 89; AZ U:13:248/SR 93	Historic highway	Near northern terminus of SR 303L ^b	Determined eligible, Criterion D; segment in APE ^c determined noncontributing	None
AZ N:3:32 (ASM) Santa Fe, Prescott & Phoenix Railway Line (now owned by Burlington Northern Santa Fe Railroad)	Historic railroad	Parallels US 60 ^d near northern terminus	Determined eligible, Criterion A	None; roadway ramps would be depressed under the railroad
AZ T:7:46 (ASM)	Prehistoric artifact scatter	Within existing SR 303L R/W ^e north of Beardsley Road	Determined not eligible	None
AZ T:7:69 (ASM)	Prehistoric artifact scatter	Near northern terminus of APE	Unknown	Avoidance
AZ T:7:70 (ASM)	Historic artifact scatter	Along northeastern APE boundary	Unknown	Avoidance
AZ T:7:71 (ASM)	Historic artifact scatter	Along northeastern APE boundary	Unknown	Avoidance
AZ T:7:72 (ASM)	Historic artifact scatter	Along northeastern APE boundary	Unknown	Avoidance
AZ T:7:73 (ASM)	Historic artifact scatter	Near northwestern APE boundary	Unknown	Avoidance
AZ T:7:77 (ASM)	Historic homestead	Within APE, north of US 60	Unknown	Avoidance
AZ T:7:78 (ASM)	Historic artifact scatter	Within APE, north of US 60	Recommended eligible	Avoidance
AZ T:7:142 (ASM)	Prehistoric artifact scatter and feature	South of US 60 along western APE boundary	Recommended eligible	Avoidance
AZ T:10:83 (ASM) Roosevelt Canal	Historic irrigation canal	Existing SR 303L south of I-10 ^f within the APE	Determined eligible, Criterion A; it's unknown if segments in the APE are contributing	Avoidance
AZ T:11:132 (ASM) Cotton Lane	Historic road	Within APE	Recommended potentially eligible, Criterion D	Avoidance
NA15138	Prehistoric artifact scatter and feature	Near northern terminus of APE	Unknown	Avoidance

^a National Register of Historic Places^c area of potential effects^e right-of-way^b State Route 303 Loop^d United States Route 60^f Interstate 10

Agency Coordination

A summary of agency consultation is included in Table 4-17, beginning on this page. Additional steps in the Section 106 consultation process consist of consulting on the results and eligibility recommendations of the remaining areas of the APE to be surveyed and any newly identified cultural resources in accordance with the Programmatic Agreement (PA) developed and executed for this undertaking. The agency and tribal consultation letters are included in Appendix C, *Cultural Resources Consultation Letters*, and the executed PA is in Appendix D, *Programmatic Agreement*.

Table 4-17. Record of agency consultation

Date sent	Purpose of consultation	Consulting parties	Date responded	Response
10/03/06	To request concurrence from agencies on: 1. the NRHP ^a eligibility recommendations 2. the need for additional survey and “treatment” (eligibility evaluations) 3. the recommendation to develop a PA ^b	Arizona State Land Department	— ^c	—
		City of Glendale	10/06/06	Concurred
		Flood Control District of Maricopa County	—	—
		Maricopa County Department of Transportation	No date	Concurred; provided summary letter of phase 1 data recovery results for MCDOT ^d project at Morocco Ruin
		State Historic Preservation Office	10/16/06	Concurred
10/03/06	To request concurrence from tribes and input on: 1. the NRHP eligibility recommendations 2. the need for additional survey and “treatment” (eligibility evaluations) 3. the recommendation to develop a PA 4. TCP ^e concerns	Gila River Indian Community	—	—
		Hopi Tribe	10/13/06	Concurred
		Pascua Yaqui Tribe	—	—
		Salt River Pima Maricopa Indian Community	—	—
		San Carlos Apache Tribe	—	—
		Yavapai-Apache Nation	—	—
		Yavapai Prescott Indian Tribe	1/11/07	Concurred; no TCP concerns

(continued on next page)

Table 4-17. Record of agency consultation (*continued*)

Date sent	Purpose of consultation	Consulting parties	Date responded	Response
12/18/06 to 12/20/06	To request concurrence from agencies on the adequacy of the Draft PA	Arizona State Land Department	—	—
		Arizona State Museum	1/08/07	Concurred
		City of Glendale	—	—
		Flood Control District of Maricopa County	02/02/07	Concurred
		Maricopa County Department of Transportation	01/16/07	Concurred
		State Historic Preservation Office	02/27/07	Concurred
12/18/06 to 12/20/06	To request concurrence from tribes on the adequacy of the Draft PA	Gila River Indian Community	—	—
		Hopi Tribe	12/26/06	Deferred comment on the PA to the other consulting tribes; requested the opportunity to review and comment on all work plans and findings reports for any adversely affected sites
		Pascua Yaqui Tribe	—	—
		San Carlos Indian Tribe	02/02/07	Concurred
		Salt River Pima-Maricopa Indian Community	—	—
		Yavapai-Apache Nation	01/03/07	Concurred
01/19/07	To request participation	Yavapai-Prescott Indian Tribe	—	—
		Advisory Council on Historic Preservation	05/07/07	Declined participation

(continued on next page)

Table 4-17. Record of agency consultation (*continued*)

Date sent	Purpose of consultation	Consulting parties	Date responded	Response
08/27/07	To request signatures from agencies on Final PA	Arizona Department of Transportation	08/08/07	Signed the Final PA
		Arizona State Land Department	—	—
		Arizona State Museum	11/29/07	Signed the Final PA
		City of Glendale	08/28/07	Signed the Final PA
		Federal Highway Administration	08/24/07	Signed the Final PA
		Flood Control District of Maricopa County	—	—
		Maricopa County Department of Transportation	09/17/07 01/16/07	Signed the Final PA
		State Historic Preservation Office	08/29/07	Signed the Final PA
		U.S. Army Corps of Engineers	—	—
08/27/07	To request signatures from tribes on Final PA	Gila River Indian Community	—	—
		Pascua Yaqui Tribe	09/25/07	Signed the Final PA
		Salt River Pima-Maricopa Indian Community	—	—
		Yavapai-Apache Nation	—	—
		Yavapai-Prescott Indian Tribe	—	—

^a National Register of Historic Places^b programmatic agreement^c not applicable^d Maricopa County Department of Transportation^e traditional cultural property

FHWA and ADOT made eligibility determinations or reiterated earlier determinations for two of the historic sites and one of the prehistoric sites located within the APE and requested and received concurrence from SHPO and other consulting parties. The NRHP eligibility is unknown for seven of the sites. Three of the sites have been recommended NRHP eligible, but no formal determination has been made. Finally, the entirety of the Roosevelt Canal has been determined NRHP eligible; however, it is unknown whether segments of the canal located within the APE have been evaluated.

Sites previously evaluated for NRHP eligibility are discussed in more detail below:

- US 60 has been determined eligible for listing in the NRHP as part of the Historic State Highway System under Criterion D for its potential to yield important information about the development of Arizona's roadways. Because the segment in the APE is a modern realignment that no longer retains its historic characteristics, it has been determined that the segment is noncontributing to the highway's overall eligibility and that the undertaking would not result in an adverse effect on the historic highway or the Historic State Highway System.
- The Santa Fe, Prescott & Phoenix Railway Line (now owned by BNSF), including the segment within the APE, has been determined eligible for listing in the NRHP under Criterion A for its association with the development of Arizona's railroads. Because the project would not alter the railroad's function, location, and design, nor would it cause undesirable visual, auditory, or atmospheric intrusion, it has been determined that the undertaking would not result in an adverse effect on the historic property.
- The prehistoric artifact scatter, AZ T:7:46 (ASM), was subjected to surface collection and archaeological testing as part of a previous investigation and was found to lack depth (Rodgers 1989). As a result of a subsequent field visit by EcoPlan Associates, Inc., in 2006, during which no evidence of AZ T:7:46 (ASM) was found, the site was determined to be not eligible for NRHP consideration (Jacobs [SHPO] to Greenspan [ADOT], May 9, 2006).

2. Environmental Consequences

Preferred Alternative

At this time, a determination of project effect has not been made. FHWA and ADOT have developed a PA to guide historic preservation compliance for the project in the future. This proposed project would require new R/W. Accordingly, if the project advances, additional survey may be required.

To date, the Santa Fe, Prescott & Phoenix Railway line is the only cultural resource located within the APE that has been determined to be eligible for listing in the NRHP. The railroad would not be subject to physical disturbance because the roadway ramps would be depressed under the railroad.

Furthermore, FHWA and ADOT have determined that the Santa Fe, Prescott & Phoenix Railway line would not be adversely affected by the project because its function, location, and design would not be altered, nor would the project cause undesirable visual, auditory, or atmospheric intrusions. SHPO and other consulting parties have concurred with FHWA and ADOT's recommendations for

further treatment and additional survey (consultation letters are included in Appendix C, *Cultural Resources Consultation Letters*).

No-Build Alternative

Should the No-Build Alternative be selected, this project would have no adverse effects on any archaeological or historic sites located within the project APE. However, because of currently planned and projected growth in the western portion of the Phoenix metropolitan area, cultural resources properties and sites in areas destined for development may eventually be disturbed.

3. Mitigation Measures

- Any adverse impacts on sites eligible for or listed in the NRHP as a result of the proposed project would require mitigation prior to project construction. Ideally, any sites located within the footprint of disturbance would be avoided. If avoidance were not possible, any negative impacts on the sites would be mitigated (refer to the signed PA in Appendix D).
- If previously unidentified cultural resources were to be encountered during activity related to the construction of the project, the contractor would stop work immediately at that location and take all reasonable steps to secure the preservation of those resources. The Resident Engineer would contact ADOT's Historic Preservation Team at (602) 712-7767 immediately and make arrangements for the proper treatment of those resources.

4. Conclusion

Although the existing SR 303L R/W has been previously investigated, the majority of the APE outside the existing R/W still requires a cultural resources survey. Fourteen prehistoric or historic sites have been previously documented within the APE.

One site, the Santa Fe, Prescott & Phoenix Railway line, is eligible under Criterion A. Should the Preferred Alternative be selected, however, the railroad would not be subjected to physical disturbance because the roadway ramps would be depressed under the railroad. Furthermore, FHWA and ADOT have determined that the historic railway would not be adversely affected by the project because its function, location, and design would not be altered, nor would the project cause undesirable visual, auditory, or atmospheric intrusions. The prehistoric artifact scatter [AZ T:7:46 (ASM)] has been determined not eligible for NRHP consideration. The segment of US 60 within the APE has been determined to be a noncontributing element of the site's overall eligibility.

The remaining 11 sites within the APE have either not been evaluated or have not received an eligibility determination. Avoidance is recommended for these sites. However, if any of the sites cannot be avoided, further research and mitigation may be required prior to initiating project construction. If additional archaeological sites, historic buildings or structures, or other significant cultural resources were to be identified during subsequent phases of the project, project effects on those determined eligible for listing in the NRHP would need to be considered.

Should the No-Build Alternative be selected, this project would have no adverse effects on any prehistoric or historic sites located within the APE. However, because of currently planned and projected growth in the western portion of the Phoenix metropolitan area, cultural resources properties and sites in areas destined for development may eventually be disturbed.

K. Prime and Unique Farmland

This section identifies prime and unique farmland that may be affected by the proposed SR 303L improvements. An analysis of prime and unique farmland is being conducted because there is a “federal action” associated with the SR 303L study. This section addresses compliance with the Farmland Protection Policy Act (FPPA) regulations (Title 7 C.F.R. § 658). The FPPA requires identification of proposed actions that would affect land classified as prime or unique farmland before federal agency approval of any activity that would convert such farmland to other uses, including converting farmland to R/W for freeway improvements. The Natural Resources Conservation Service (NRCS), part of the U.S. Department of Agriculture (USDA), administers the FPPA as it relates to protection of farmland.

Congress put forth the FPPA as a result of a substantial decrease in the amount of open farmland. The Secretary of Agriculture is required under the FPPA to set criteria to identify and take into account the potential effects of federal agency activities on the preservation of farmland.

The FPPA regulations (7 C.F.R. § 658.5) establish the criteria for such evaluation, with an emphasis on urban aspects of proposed programs (USDA 2006). In 7 C.F.R. § 658.3, it is stated that the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses will be minimized. In 7 C.F.R. § 658.4, it is stated that federal programs shall be administered in a manner that, as practicable, will be compatible with state and local government and private programs and policies to protect farmland. It requires identification of proposed federal actions that would affect any land classified as prime and unique farmland and the consideration of alternative actions.

Pursuant to the FPPA, “farmland” includes:

- Prime – Land that “has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion, as determined by the Secretary. Prime farmland includes land that possesses the above characteristics but is being used currently to produce livestock and timber.” [7 United States Code (U.S.C.) § 4201(c)(1)(A)]
- Unique – Land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, fruits, and vegetables. “It has the special combination of soil quality, location, growing season, and moisture supply needed to

economically produce sustained high quality or high yields of specific crops when treated and managed according to acceptable farming methods.” [7 U.S.C. § 4201(c)(1)(B)]

- Other – This encompasses farmland, “other than prime or unique farmland, that is of statewide or local importance for the production of food, feed, fiber, forage, or oilseed crops, as determined by the appropriate State or unit of local government agency or agencies, and that the Secretary determines should be considered as farmland for the purposes of this chapter.” [7 U.S.C. § 4201(c)(1)(C)]

In the FPPA regulations (7 C.F.R. §§ 658.2–658.3), a description of land not subject to (not protected by) provisions of the FPPA is provided:

- land that receives a combined score of less than 160 points from the land evaluation and site assessment criteria
- land identified as an “urbanized area” on U.S. Census Bureau maps
- land designated as an urban area and shown as a “tint overprint” on U.S. Geological Survey topographical maps
- areas shown as white (not farmland) on USDA Important Farmland Maps
- areas shown as “urban-built-up” on USDA Important Farmland Maps (according to guidance of the National Resources Inventory, areas 10 acres or larger without structures are not considered urban-built-up and are subject to the FPPA)
- land used for national defense purposes
- private land where no federal funds or technical assistance are used

“Farmland” does not include land already in or committed to urban development or water storage if identified in a plan prior to August 4, 1984 (see FPPA exemption discussion below). Farmland already in urban development or water storage includes all such land with a density of 30 structures per 40-acre area.

Projects exempt from the FPPA (7 C.F.R. § 658.2) include those construction or improvement projects considered to be “beyond the planning stage and in either the active design or construction state on August 4, 1984.” FPPA exemptions also apply if any of the following had occurred by that date:

- Acquisition of land or easements for the project had occurred or all required federal agency planning documents and steps were completed and accepted, endorsed, or approved by the appropriate agency.

- A final EIS was filed with EPA or an EA had been completed and a FONSI was executed by the appropriate agency official.
- The engineering or architectural design had begun or such services had been secured by contract.

1. Existing Conditions

Land in the generally 1-mile-wide corridor surrounding SR 303L includes approximately 6,328 acres of prime and unique farmland. It is important to note that prime farmland and agricultural land (as identified in Part 4, Section A, *Land Ownership, Jurisdiction, and Land Use*, on page 62) are not defined the same. The agricultural land use designation is a product of local community planning efforts, while the prime and unique farmland designation is specific to NRCS criteria (i.e., irrigation conveyance and soil type) according to the FPPA. The difference between the agricultural land use designation and the prime and unique farmland designation results in different acreage estimates. Crop production in the Study Area includes cotton, citrus, grapes, corn, melons, and flowers (roses). Several nursery/tree farm operations and feedlots are also in the area.

Feedlots and dairy facilities are considered land that possesses prime farmland characteristics for the purpose of producing livestock. Language to this effect is found in the FPPA [7 U.S.C. § 4201(c)(1)(A)]. Several feedlots and dairy facilities are found in the Study Area, but they are not considered prime and unique farmland because they do not meet the FPPA criteria, which state:

“In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation.” [7 C.F.R. § 657.5(a)(1)]

The Phoenix NRCS office interprets this regulation to mean that an irrigation system must be in place and functioning. Therefore, feedlots and dairy facilities would not be considered prime farmland. In addition, feedlots and dairy facilities do not necessarily need to be placed on “prime” soils to be productive.

Farming businesses adjacent to SR 303L or in the Study Area include Tanita Farms, Miedema Produce, Cotton Lane Farms, Green Farms, and Cactus Lane Ranch. Agricultural operations in the Study Area use groundwater, Agua Fria River water, and Central Arizona Project water (ADWR 1998). Irrigation deliveries are conveyed in earthen or concrete-lined canals by the Adaman Irrigation and Water Delivery District, Maricopa County Municipal Water Conservation District, or RID.

2. Environmental Consequences

Preferred Alternative

The FPPA requires that federal agencies identify and consider the potential adverse effects of their programs and policies on the preservation of farmland. As defined by the FPPA, “farmland” is land that is not already in or committed to urban development. Based on local government general plans and zoning, much of the land in the Study Area is committed to urban development.

However, the fact that the local government plans designated existing agricultural land as future urbanized areas does not exempt that land from the FPPA. In a 2006 response to the author’s inquiry, NRCS wrote, “The only way to exempt lands from the Act are explained therein (7 C.F.R. Part 658.2). A Comprehensive Land Use Plan that designates land to urban development, in itself, does not exempt such lands from the Act.”²

Some of the farmland along the SR 303L corridor lies within the noise contour and accident potential zone for Luke AFB. As such, these areas are unsuitable for residential development, and initiatives to preserve this farmland as a buffer for the base have occurred.

To determine the existence of prime or unique farmland or farmland of statewide or local importance, consultation was initiated with the NRCS. NRCS has determined that all agricultural land in the Study Area is either prime or unique because it is irrigated.³ The USDA Farmland Conversion Impact Rating for Corridor Type Projects (NRCS-CPA-106 form) was prepared in 2007 for the proposed project and approved by NRCS (see Appendix E, *Farmland Conversion Impact Rating Form*). If the score resulting from the completion of the NRCS-CPA-106 form is 160 points or greater, then alternatives to avoid and/or minimize farmland impacts should be provided.

For this study, the NRCS-CPA-106 form was filled out for a larger Study Area encompassing the current SR 303L study corridor and extending south to the Gila River. The corridor scored fewer than 160 points (it received a score of 155 points) and, thus, is considered urban by NRCS and is exempt from the FPPA.

NRCS has designated certain soils in the Study Area (USDA 2007) as prime and/or unique farmland (see the soils list in Appendix E). These soils fall into three categories: 1) farmland of unique importance, 2) prime farmland if irrigated, and 3) prime farmland if irrigated and either

² NRCS letter to ADOT care of HDR Engineering, Inc., April 19, 2006, regarding the interpretation of land to be urbanized by local jurisdictions

³ telephone communication with Jeff Schmidt, NRCS Farm and Ranch Lands Protection Program Specialist, February 8, 2005

protected from flooding or not frequently flooded during the growing season. Because the NRCS determined that all agricultural land in the Study Area is either prime or unique because it is irrigated, no soils analysis was conducted.

To accommodate future construction of the ultimate roadway, additional R/W would be needed, primarily obtainable by taking farmland acres out of production. Construction of the proposed improvements would require acquisition of approximately 800 acres of agricultural land. However, the conversion of agricultural land to urban uses is consistent with long-range planning.

No-Build Alternative

Selection of the No-Build Alternative would have no impact on farmland. However, without the proposed action, the conversion of land from agricultural uses to residential, commercial, and industrial uses (urban land uses) is projected to continue. Because of the urban growth of the Phoenix metropolitan area, it is likely that farmland in the Study Area would eventually be lost through conversion to urban land uses.

3. Mitigation Measures

The SR 303L corridor received a score of 155 points on the NRCS-CPA-106 form (completed for the larger SR 303L Study Area in 2007). Because the corridor scored fewer than 160 points, it is considered urban by NRCS and is exempt from the FPPA. Therefore, no mitigation measures for farmland would be necessary.

4. Conclusion

Selection of the Preferred Alternative would necessitate the acquisition of approximately 800 acres of agricultural land. However, this agricultural land is considered urban by NRCS and is exempt from the FPPA. Sites receiving a total score on the NRCS-CPA-106 form of less than 160 need not be given further consideration for protection, and additional evaluation is not required. The SR 303L corridor scored 155 points.

The No-Build Alternative would have no impact on prime or unique farmland, other than continued conversion of agricultural land consistent with local plans.

L. Social Conditions

This section summarizes existing social conditions in the Study Area and describes potential impacts that may be caused by implementation of the Preferred Alternative. Data from the 2000 U.S. Census are used for this analysis.

1. Existing Conditions

Demographics

Demographic data obtained from the U.S. Census Bureau were used to compare the demographic profile of the Study Area with that of Maricopa County and with those of the cities of Goodyear, Glendale, and Surprise. Table 4-18, on page 147, presents population information for each area, including the gender and age distribution.

The smallest unit of available census data was chosen to analyze each of the demographic characteristics for the Study Area. Census tract level data from the 2000 Census⁴ were used to identify disabled, gender, income, age, and minority demographics.

The study limits are located within the following ten Census tracts: Goodyear tracts 610.04, 610.05, and 610.09; unincorporated Maricopa County tracts 610.06 and 610.07; and Surprise tracts 610.08, 405.05, 405.09, 405.10, and 405.11. Census tracts represent small statistical subdivisions of a county.

⁴ While the population of each jurisdiction has increased since 2000, the 2000 Census remains the most comprehensive source of demographic data available for the Study Area. When appropriate or available, other, more recent socioeconomic data are cited.

Table 4-18. Demographic characteristics for Maricopa County, municipalities, and Census tracts, from the 2000 U.S. Census

Geographic area	Total population (2000)	Gender (%)		Age composition (%)				
		Male	Female	0–17	18–24	25–44	45–64	65+
Maricopa County	3,072,149	50.1	49.9	27.0	10.2	31.4	19.8	11.7
City of Goodyear	18,779	50.7	49.3	22.2	8.5	34.6	24.5	9.7
City of Glendale	218,596	49.1	50.9	29.9	10.6	32.1	19.9	7.4
City of Surprise	30,886	48.3	51.7	19.8	7.0	22.7	25.3	25.2
Goodyear Census tract 610.04	4,309	52.8	47.2	30.6	12.8	33.9	18.4	4.3
Goodyear Census tract 610.05	6,458	52.1	47.9	7.4	7.6	31.7	34.1	19.2
Goodyear Census tract 610.09	96	53.1	46.9	31.3	2.1	30.2	25.0	11.5
Unincorporated Maricopa County Census tract 610.06	8,067	59.1	40.9	28.9	11.1	30.0	23.2	6.7
Unincorporated Maricopa County Census tract 610.07	4,392	51.7	48.3	27.6	11.3	37.7	17.7	5.7
Surprise Census tract 610.08	2,021	50.1	49.9	30.1	10.5	39.9	15.2	4.3
Surprise Census tract 405.05	8,888	46.2	53.8	0.1	0.1	1.0	15.2	83.6
Surprise Census tract 405.09	15,675	49.2	50.8	17.8	4.2	15.8	27.0	35.3
Surprise Census tract 405.10	5,560	39.8	60.2	0.1	0.4	1.1	48.1	50.2
Surprise Census tract 405.11	2,557	43.3	56.7	1.1	0.4	2.2	39.1	57.3

Source: U.S. Census 2000

Note: The 2005 population was 3,768,123 for Maricopa County; 236,492 for Glendale; and 103,402 for Surprise (U.S. Census Bureau 2006). The 2006 population for Goodyear was 49,720 (Arizona Department of Commerce 2007). The table uses the 2000 Census data because they contain demographic elements not collected for the mid-decade census.

Title VI and Environmental Justice

Title VI of the Civil Rights Act of 1964 and related statutes ensure that individuals are not excluded from participation in, denied the benefit of, or subjected to discrimination under any program or activity receiving federal financial assistance on the basis of race, color, national origin, age, sex, and disability. Executive Order 12898 on Environmental Justice directs that programs, policies, and activities not have a disproportionately high and adverse human health and environmental effect on minority and low-income populations. The rights of women, the elderly, and the disabled are protected under related statutes.

Protected populations analyzed for this study include disabled, low-income, elderly, female head-of-household, and minority populations, described in the following subsections. The distribution of disabled, low-income, elderly, and female head-of-household populations is summarized in Table 4-19, on this page.

Table 4-19. Disabled, low-income, elderly, and female head-of-household populations in the Study Area

Geographic area	Disabled (%)	Low-income^a (%)	Elderly (%)	Female head-of-household (%)
Maricopa County	17.1	7.5	11.7	2.4
City of Goodyear	14.2	3.8	9.7	1.4
City of Glendale	17.2	7.2	7.4	2.9
City of Surprise	19.5	5.4	25.2	1.2
Goodyear Census tract 610.04	12.2	3.0	4.3	1.9
Goodyear Census tract 610.05	17.1	8.3	19.2	0.3
Goodyear Census tract 610.09	0.0	0.0	11.5	1.0
Unincorporated Maricopa County Census tract 610.06	19.6	5.9	6.7	1.8
Unincorporated Maricopa County Census tract 610.07	19.5	2.3	5.7	1.2
Surprise Census tract 610.08	14.8	2.3	4.3	1.6
Surprise Census tract 405.05	37.2	1.3	57.1	2.6
Surprise Census tract 405.09	41.6	11.8	35.6	3.8
Surprise Census tract 405.10	16.9	1.1	50.2	0.0
Surprise Census tract 405.11	22.8	4.0	57.3	0.2

Source: U.S. Census 2000

^a U.S. Department of Health and Human Services 2000 poverty guideline = \$17,050 annual income for a family of four

Disabled Populations

Disabled populations are civilian, noninstitutionalized persons aged 5 and over with disabilities (such as sensory, physical, mental, self-care, going outside of home, and employment disabilities). Five Census tracts in the Study Area—tracts 610.06, 610.07, 405.5, 405.09, and 405.11—have higher percentages of disabled individuals than Maricopa County.

Low-Income Populations

Low-income populations include people with a median annual household income at or below the U.S. Department of Health and Human Services 2000 poverty guideline (\$17,050 for a family of four). Based on the demographic data evaluated, Goodyear Census tract 610.05 and Surprise Census tract 405.09 had a higher portion of individuals living below poverty level (8.3 and 11.8 percent, respectively) compared with the value for Maricopa County (7.5 percent). Median incomes in the Study Area are, however, generally above the county median income.

Elderly Populations

Elderly populations consist of people who are age 65 and older. While elderly citizens often drive, the National Highway Traffic Safety Administration reports that both high-speed and high-traffic routes may present a problem for some (National Highway Traffic Safety Administration 2007). In addition, the elderly may have a need for transit service or may opt to use transit if it is offered.

Four Census tracts in Surprise, 405.05, 405.09, 405.10, and 405.11, overlap the Sun City Grand and Sun City West communities and other nearby retirement communities. One Census tract in Goodyear (610.05) includes the Pebble Creek retirement community. As a result, the percentage of individuals over 65 years old in these tracts is substantially higher than the county average (57.1 percent, 35.6 percent, 50.2 percent, 57.3 percent, and 19.2 percent, respectively, compared with the county average of 11.7 percent).

Female Head-of-Household Populations

Female head-of-household populations consist of households headed by a female with no husband present and with her own children under the age of 18. These households tend to have lower incomes than households headed by married couples or a single man and oftentimes have a greater need for affordable housing. Percentages of female head-of-household populations within the Study Area are generally comparable to or lower than those of the county (an average of 2.4 percent), with the exception of Surprise Census tracts 405.05 (2.6 percent) and 405.09 (3.8 percent) and the City of Glendale (2.9 percent).

Minority Populations

A minority population can be described as an area wherein the percentage of residents who are from a minority population is meaningfully greater than (i.e., exceeds by 50 percent) the average percentage of minority population for the surrounding area (either cities or county). The proposed improvements to SR 303L traverse three cities and unincorporated county land. Census data were reviewed to determine the various minority groups living in the project vicinity.

Based on U.S. Census 2000 data, Maricopa County has a minority percentage of 33.8; Surprise has a minority percentage of 28.2; Glendale has a minority percentage of 35.3; and Goodyear has a minority percentage of 30.0. All ten Census tracts in the Study Area have minority populations whose percentages are lower than the minority percentage for Maricopa County. The distribution of minority populations is summarized in Table 4-20, on this page.

Table 4-20. Minority demographics for Maricopa County, municipalities, and Census tracts in 2000

Ethnic composition	White not Hispanic (%)	Hispanic origin (%)	Black not Hispanic (%)	Native American not Hispanic (%)	Asian not Hispanic (%)	Other not Hispanic (%)	Percentage minority
Maricopa County	66.2	24.8	3.7	1.8	2.2	1.3	33.8
City of Goodyear	70.0	20.8	5.0	0.9	1.7	1.6	30.0
City of Glendale	64.7	24.8	4.5	1.1	2.7	2.2	35.3
City of Surprise	71.8	23.3	2.4	0.3	1.0	1.2	28.2
Goodyear Census tract 610.04	69.8	22.7	4.4	0.4	0.7	2.0	30.2
Goodyear Census tract 610.05	72.0	18.2	7.1	1.8	0.6	0.3	28.0
Goodyear Census tract 610.09	77.0	23.0	0.0	0.0	0.0	0.0	23.0
Unincorporated Maricopa County Census tract 610.06	67.4	25.6	2.1	0.7	1.9	2.3	32.6
Unincorporated Maricopa County Census tract 610.07	71.5	20.4	3.5	0.4	1.8	2.4	28.5
Surprise Census tract 610.08	79.1	13.9	3.2	0.5	1.2	2.1	20.9
Surprise Census tract 405.05	98.0	0.3	0.5	0.1	0.4	0.7	2.0
Surprise Census tract 405.09	81.4	15.8	0.3	0.9	0.4	1.2	1.1
Surprise Census tract 405.10	97.1	0.7	0.7	0.2	0.7	0.6	2.9
Surprise Census tract 405.11	98.0	0.8	0.4	0.2	0.2	0.4	2.0

Source: U.S. Census 2000

Neighborhood Continuity

The proposed project would be constructed through areas that are undeveloped (agricultural) or adjacent to neighborhoods that have included SR 303L in their development and have, accordingly, developed in such a way that those neighborhoods would not be bisected by the proposed improvements. Because the SR 303L corridor has been established since 1985, local jurisdictions and developers have built with respect given to the planned—or actual—SR 303L alignment. The Sun City Grand development in Surprise is an example where development preserved the highway corridor—the community phases included grade-separated roadways over SR 303L to connect the multiple phases of residential development.

Emergency Services

Public and emergency services facilities were reviewed within a radius of approximately 5 miles from the SR 303L alignment. The fire stations nearest to the Study Area are the City of Surprise Fire Station #303, located at Cotton Lane and Greenway Road about 0.5 mile west of SR 303L, and the City of Surprise Fire Station #2, located about 2 miles east of the SR 303L corridor at the intersection of Reems Road and Mountain View Boulevard. The Surprise Police Station is located in the municipal center about 2.5 miles east of the SR 303L corridor, near Bullard Avenue and Greenway Road. The Goodyear police and fire stations are located over 5 miles south and east of SR 303L and I-10. The closest hospital is the Del E. Webb Memorial Hospital, which is located about 2 miles southeast of the SR 303L and US 60 intersection.

Social Services, Schools, Recreation

The following is a discussion of public facilities or services in the Study Area.

Parks

Three major parks serve the Study Area: White Tank Regional Park, Estrella Mountain Regional Park, and Surprise Recreation Center. White Tank Regional Park is a large, relatively undeveloped natural area, located about 4.5 miles west of the Study Area, with picnic and camping areas, bicycle trails, and hiking trails. One of the access roads to the park is Olive Avenue, a major east–west cross street to SR 303L. Estrella Mountain Regional Park is also a large natural park that has trails for hiking, equestrian use, camping, and biking. It contains the Casey Abbot Recreation Area, which has picnic ramadas, volleyball areas, playgrounds, and a golf course. Estrella Mountain Regional Park is located 1.5 miles east of Cotton Lane and approximately 0.75 mile south of the Gila River. The Maricopa County Parks and Recreation Department manages both regional parks.

The Surprise Recreation Center is located about 2.5 miles east of the Study Area, between Bullard Avenue and Reems Road, just south of Bell Road. The campus is a new facility that includes a Major League Baseball spring training stadium, an amphitheater, baseball practice fields, an aquatic center, basketball courts, a library, and a community park with an urban fishing lake. In December 2008, the campus is expected to house the city administrative offices. A summary of city parks within the Study Area is provided in Part 4, Section N, *Section 4(f) and Section 6(f) Resources*, on page 163.

Schools

Currently, four schools are located within the Study Area. Three schools are located in Surprise: Cimarron Springs Elementary School, E-Institute Charter High School, and Sonoran Heights Elementary School. The Cimarron Springs and Sonoran Heights elementary schools are part of the Dysart Unified School District. The E-Institute Charter High School is not affiliated with a school district. Desert Thunder Elementary School is located in Goodyear and is part of the Avondale Elementary School District.

- Cimarron Springs Elementary School opened in 2004 and is located 0.25 mile north of Greenway Road, approximately 0.5 mile west of SR 303L.
- Desert Thunder Elementary School is located 0.3 mile east of Cotton Lane and 0.25 mile south of I-10.
- E-Institute Charter High School is located 0.33 mile east of SR 303L on Greenway Road.
- Sonoran Heights Elementary School is located 0.5 mile east of SR 303L and 0.33 mile south of Greenway Road.

All school sites are within the Study Area but are not adjacent to SR 303L.

Public Transportation

Valley Metro provides public transportation service in the Study Area. One transit loop serves Luke AFB. This bus loop ends at Litchfield Road and Glendale Avenue, about 3.5 miles east of SR 303L. Weekday rapid-transit routes to downtown Phoenix and Scottsdale are also available. These routes depart from the Surprise Recreation Center at Greenway Road and Bullard Avenue. As growth occurs in the West Valley, additional transit or bus routes could be expected in the future.

Equestrian, Pedestrian, and Bicycle Facilities

Although bicycles, horses, and pedestrians may occasionally use the SR 303L corridor R/W, no existing facilities have been constructed specifically for those purposes. The Sun Valley Parkway Bike Route is designated as beginning at Bell Road and SR 303L. The route travels west on Bell Road, eventually joining Sun Valley Parkway west of the White Tank Mountains. This is a signed, on-street route, and no separate facility is provided. Maricopa County has identified long-range plans for on-road bike lanes on Olive Avenue and Cotton Lane.

Libraries

No libraries are currently located within the Study Area. The nearest library to the Study Area is the Northwest Regional Library, in Surprise, located 2.5 miles east of SR 303L and 0.5 mile south of Bell Road on Bullard Avenue.

Post Offices

One post office is located in the Study Area. It is located 0.5 mile west of SR 303L on Bell Road.

2. Environmental Consequences

Preferred Alternative

Title VI and Environmental Justice

There are defined low-income or minority populations located within the Study Area. No residential property takes are expected as a result of implementation of the proposed project because needed R/W would largely consist of agricultural land. The proposed project is anticipated to improve the transportation system in the Study Area. Along with the general population, protected populations would benefit from the proposed improvements. Accessibility to regional public and private facilities and services would be improved. The project would not have disproportionate impacts on minority or other protected populations. Therefore, no impacts are expected to occur to those populations.

The proposed improvements would not require obtaining residential R/W or relocating residents within Study Area retirement communities. The age-restricted subdivisions of Sun City West, Sun City Grand, and Pebble Creek would experience higher noise levels with implementation of the Preferred Alternative than with the No-Build Alternative. Noise impacts would be mitigated according to FHWA and ADOT criteria (see Part 4, Section H, *Noise Levels*, on page 121), with the

impacts being comparable to those impacts that would be experienced by other nonretirement communities adjacent to SR 303L.

Similarly, potential air quality impacts on retirement community developments would be comparable throughout the project (see Part 4, Section G, *Air Quality*, on page 99). No exceedances of the NAAQS would occur with implementation of the Preferred Alternative.

In summary, no disproportionate adverse impacts are expected to be experienced by minorities, low-income populations, or the elderly in the Study Area.

Throughout the planning process, efforts were made to keep protected populations informed and to solicit input. For example, the Study Team attended several homeowners' association meetings in Sun City West and Sun City Grand. One of the formal public meetings was held in the afternoon (rather than in the evening) to provide an alternative to an evening meeting.

Neighborhood Continuity

All development planning in the corridor has been accomplished with SR 303L as an integral element; therefore, no neighborhoods would experience a loss of cohesion. As mentioned previously, the Sun City Grand development in Surprise is an example where development preserved the highway corridor and where community phasing included grade-separated roadways over SR 303L to connect the multiple phases of residential development. Implementation of the Preferred Alternative would not divide any established residential areas.

Emergency Services

Implementation of the proposed improvements would not cause any long-term adverse effects on emergency services. Construction of the SR 303L improvements could be expected to improve response time for emergency vehicles. Temporary construction impacts at the cross-street traffic interchanges would likely affect response times. No impacts would occur on the hospital. Improved access at SR 303L and US 60 could be expected to reduce travel time to the hospital. During construction, response times could be temporarily adversely affected.

Social Services, Schools, Recreation

No public facility displacements would be required by this proposed project. No temporary construction impacts on parks, schools, libraries, or post offices would be expected because none of these public facilities or services is near SR 303L. No impacts on the existing or new library would occur as a result of implementation of the SR 303L improvements.

No direct or indirect impacts on schools would be expected. School bus routes cross SR 303L on existing arterial streets and would continue that practice in the future. No pedestrian crossings of SR 303L occur except at Bell Road. With the Preferred Alternative, all street crossings would be grade-separated and include pedestrian crosswalks. Therefore, no impacts on school bus service or pedestrian movement would be expected to occur.

As proposed, the SR 303L project would have no effect on transit routes, but it could benefit any future bus transit expansion in the general area by improving traffic conditions on local arterial streets. Temporary construction impacts on public transportation routes could be expected, should future service extend to SR 303L.

The Preferred Alternative would not adversely affect the current limited alternative transportation mode facilities but would provide improved conditions through grade-separated intersections. Temporary construction impacts on pedestrian and bicycle facilities could be expected at cross streets that would have developed by the time the SR 303L improvements would be under construction.

No-Build Alternative

Under the No-Build Alternative, additional access to planned commercial areas and neighborhoods would not be built, thus adversely affecting the area's economic potential. Traffic congestion on surface streets would increase in the future and accessibility to employment and housing could be impeded by this increased congestion. Roadway improvements initiated by local jurisdictions to address increased traffic congestion may affect access to businesses. Emergency response times could be impaired by increased congestion.

This alternative would not comply with proposed or adopted development plans within the Study Area.

3. Mitigation Measures

Title VI and Environmental Justice

No disproportionate adverse impacts are expected to be experienced by protected populations in the Study Area under the Preferred Alternative. Therefore, no mitigation measures would be necessary.

Neighborhood Continuity

Because implementation of the Preferred Alternative would not divide any established residential areas, no mitigation measures would be necessary.

Emergency Services

- During the final design phase, ADOT would communicate and coordinate with emergency services providers to minimize the potential for slower response times associated with construction.

Social Services, Schools, Recreation

- During the final design phase, ADOT would communicate and coordinate with Valley Metro to minimize the potential for bus service disruptions as a result of construction.
- ADOT and the contractor would keep bicycle and pedestrian facilities open during construction.

4. Conclusion

Selection of the Preferred Alternative would have no adverse social effects. Implementation of the Preferred Alternative would benefit current and projected populations by improving access in the area and accommodating future travel demand.

Under the No-Build Alternative, additional access to planned commercial areas and neighborhoods would not be built, thus hindering the area's economic potential. Traffic congestion on surface streets would increase in the future and accessibility to employment and housing could be impeded by this increased congestion. Roadway improvements initiated by local jurisdictions to address increased traffic congestion may affect access to businesses. Emergency response times could be impaired by increased congestion. Furthermore, this alternative would not comply with proposed or adopted development plans within the Study Area.

M. Economic Conditions

This section addresses the economic impacts of the proposed SR 303L improvements. The following discussion provides an overview of the Study Area's economic base, future economic land uses in the Study Area, potential impacts from the proposed improvements, and temporary economic impacts related to construction of the proposed freeway upgrades.

1. Existing Conditions

Portions of unincorporated Maricopa County and the cities of Goodyear, Glendale, and Surprise fall within or are directly adjacent to the Study Area. Litchfield Park is approximately 3 miles east of SR 303L, and El Mirage is approximately 4 miles east of SR 303L. Surprise is experiencing explosive growth in its residential, commercial, and industrial sectors. Although Surprise's economy has historically been heavily agricultural, considerable employment exists in the construction, trade, and service sectors because of the city's tremendous growth. The civilian labor force is 75,772 persons, with a population of 103,402 (U.S. Census 2006).

Glendale is the fourth-largest city in Arizona, with a population of 236,492 (U.S. Census 2006). Glendale's economic base is diversified, including manufacturing, services, aerospace, communications, precision metalworking and casting, chemicals, electronics, warehousing industries, and professional sports facilities. Major private employers include Thunderbird Medical Center, Schuck Component Systems, and Honeywell Satellite Systems. Major public employers are the U.S. Postal Service, Glendale Community College, Luke AFB, and the City of Glendale. The civilian labor force is 167,046 persons (U.S. Census 2006).

Goodyear has a strong economic base centered on the aerospace industry. Lockheed Martin is one of Goodyear's largest private employers. In addition to Lockheed Martin, Lufthansa's Airline Training Center and Aviation Management Systems are located on the Phoenix Goodyear Airport campus. The food processing industry is also heavily represented in Goodyear, including Poore Brothers, Snyder's of Hanover, and Duncan Family Farms. Another major employer is the Arizona State Prison Complex-Perryville. The civilian labor force in this city of 49,720 is 10,035, based on the 2007 community profile (Arizona Department of Commerce 2007).

Maricopa County as a whole has evolved from a tourism and resource-based economy to a major center for high-tech manufacturing, such as semiconductors, electronics, and aerospace. In addition to high-tech industries, the economy is expanding in customer service operations, distribution, and professional services. The county has grown from 3,072,149 residents in 2000 to a population of 3,768,123 in 2006 (U.S. Census 2000, 2006), representing a 23 percent increase in just 6 years.

Much of unincorporated Maricopa County, including the Study Area from Greenway to Camelback roads, is currently agricultural, interspersed with minor amounts of commercial and light manufacturing industry.

Luke Air Force Base

Luke AFB is a large national defense installation as well as a major contributor to the economy of the entire metropolitan area. Located west of Litchfield Road between Northern Avenue and Camelback Road in Glendale, Luke AFB's south runway is only 0.33 mile east of the Study Area. Luke AFB had 7,000 military and civilian employees during fiscal year 2007, with an annual economic impact on the West Valley of approximately \$1.4 billion (Luke AFB 2008).⁵

A study was conducted by the Arizona Department of Commerce to assess the need for and feasibility of implementing a farmland preservation district for land adjacent to the central section of the SR 303L Study Area. This land is predominantly used for agricultural purposes. Because this land is within the Luke AFB noise contour and accident potential zone, it may be able to provide the necessary buffer for continued aircraft operations into the future. Such zoning would prevent the development of this land for increased residential use. Luke AFB is planning to buy 273 acres surrounding the base to reduce encroachment. The City of Goodyear has purchased land around the base for preservation as well. In addition, the City of Phoenix owns acreage around Luke AFB as part of a long-term preservation strategy using voter-approved bond funds.

Often, military bases are vulnerable to closure because of aircraft noise complaints and encroaching residential development. Improvement of SR 303L to a freeway facility would not directly affect the base or its mission. There is concern that a freeway or any high-capacity roadway near Luke AFB would facilitate or accelerate encroaching development. Although major transportation improvements frequently provide an economic stimulus to the area, appropriate land use decisions still reside with local jurisdictions. A successful effort to establish an agricultural set-aside or development-restricted area around Luke AFB would help address concerns about base closure. The 2005 *Base Realignment and Closure Study* by the U.S. Department of Defense recommended realignment of Luke AFB through retiring some aircraft from the 56th Fighter Wing and transferring aircraft from the 944th Fighter Wing to Fresno, California. However, the 56th Fighter Wing currently remains at Luke AFB.

⁵ personal communication with Mary Jo May, Luke AFB Public Affairs, on January 11, 2008

2. Environmental Consequences

Preferred Alternative

Approximately 420 acres of new R/W would be needed for the roadway portion of the proposed improvements, and an additional 540 acres would be needed for the drainage facilities associated with the project (for a total of 960 acres). The majority of the Study Area is in private ownership, is primarily agricultural, and has been zoned “Residential” or “Rural Residential.” A few agriculture-related businesses are located along the proposed SR 303L freeway, including Miedema Produce, Inc.; Duncan Family Farms; Tanita Farms; and Greer Farms. Other private agricultural operations and ranch operations can be found west of Cotton Lane and east of Sarival Road, near the Study Area. Agricultural land needed for R/W would remove this land from agricultural production and, accordingly, from the local tax base. The land needed is, however, only a small portion of the roughly 7,200 acres of agricultural land in the Study Area, resulting in a minor impact on the regional farming industry. The conversion from farming to urban uses has been occurring along the existing corridor at both the northern and southern ends without the benefit or influence of a freeway.

The Wildlife World Zoo is located adjacent to SR 303L at Northern Avenue. Existing access off Northern Avenue would be affected because of R/W acquisition. However, the zoo is already developing a new parking layout and access off of Sarival Avenue. Additional industrial and commercial development exists at Cotton Lane, south of Cactus Road, along SR 303L, south of Olive Avenue, and along I-10. A commercial center (Greenway Crossing) is located at Greenway Road and SR 303L, and a storage facility (White Tanks Storage) is at Northern Avenue and SR 303L. Acquisition of R/W would occur at I-10 east of Citrus Road, affecting the Goodyear Market Place Swap Meet. Access would remain, but about half the property would be acquired. Some businesses would likely be affected temporarily by the inconveniences of freeway construction: noise, detours, and the need for alternative business access, for example.

Construction of the proposed SR 303L freeway upgrades would have some short-term adverse impacts on businesses within the Study Area and on travelers. Construction activities result in increased noise levels, dust and particulates, traffic congestion, and utility relocations. Construction activities would produce temporary interruptions along the 14 intersecting east–west arterial streets. Traffic control plans would need to ensure that access to these arterial streets be maintained at all times. The plans would also need to alleviate construction impacts on nearby businesses.

The temporary inconvenience to area residents and visitors would be offset by long-term economic benefits in transportation efficiency resulting in increased access, decreased travel times, and improved exposure for commercial properties.

Two business displacements would be required by implementation of the Preferred Alternative. The businesses are eligible for ADOT relocation assistance and benefits. The SR 303L/US 60 traffic interchange design would limit access in the northwest quadrant. A Adobe RV & Mini-Storage and Sav-on-Fence are both located in that quadrant. Both businesses would be acquired. The Preferred Alternative's new westbound I-10 on-ramps would adversely affect the Goodyear Market Place Swap Meet. Access would be maintained from McDowell Road. The decision on whether the acquisition would be full or partial would occur at a later date.

As described in Part 4, Section K, *Prime and Unique Farmland* (on page 141), approximately 800 acres of farmland would be removed from production under the ultimate freeway alternative. This would be an impact dispersed across several farms. Conversion is already occurring today, as evidenced by the rapid urbanization of Surprise between US 60 and Greenway Road, planned area developments (PADs) from Greenway Road south to Peoria Avenue, and development pressure south of I-10 in Goodyear.

Construction activities for the proposed freeway upgrade would provide positive temporary economic impacts through construction jobs, materials purchases, equipment leasing, construction employee income expenditures, and related multiplier effects in the region. Construction and operation expenditures would also provide a boost to the local economy.

At the regional level, productivity improvements resulting from transportation improvements can result in overall economic growth. Such improvements can also reduce travel-related costs to people and businesses and result in corresponding positive economic impacts. Expenditures on transportation, including capital and operation and maintenance costs, would bring about long-term economic benefits to the area, resulting primarily from improvements in transportation efficiency.

The proposed project's drainage component would provide a substantial benefit to the development potential of adjacent land. As an intercept facility, the channel on the west side of SR 303L and associated detention basins would reduce drainage impacts. The availability of a regional drainage system would generally benefit the entire SR 303L Study Area and surrounding land. The ability to combine the construction of SR 303L and the related ADMP features should result in an overall cost savings compared with constructing each facility at separate times.

No-Build Alternative

Planned development will occur within the Study Area regardless of the alternative selected. Under the No-Build Alternative, Luke AFB would still plan to purchase 273 acres surrounding the base to reduce encroachment.

3. Mitigation Measures

- A R/W acquisition program would be implemented by ADOT's Right-of-Way Group in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), the Uniform Relocation Act Amendments of 1987 (Public Law 100-17), and Title VI of the Civil Rights Act of 1964. Private property owners would be compensated at fair market value for land to be acquired for project R/W.
- Access to businesses and residences near the project would be maintained during construction.
- Measures to minimize construction impacts would be incorporated into construction contract specifications. Traffic would be managed by detailed traffic control plans and by procedures and guidelines specified in Part VI and the Arizona Supplement to Part VI of the *Manual on Uniform Traffic Control Devices for Streets and Highways*, 2003 edition (FHWA 2003a). Construction activities that substantially disrupt traffic would not be performed during peak travel periods. Requirements for the use of construction notices and bulletins would be identified as needed. Local agencies would be consulted regarding traffic restrictions in their respective jurisdictions to minimize disruptions to local traffic. The effectiveness of the traffic control measures would be monitored during construction, and any necessary adjustments would be made.

4. Conclusion

Selection of the Preferred Alternative would result in two business displacements, one potential business displacement, and minimal loss in property tax revenues. As redevelopment of agricultural properties to residential and commercial uses occurs, however, the general property tax revenues of the local jurisdictions would substantially increase. Major freeway construction projects require local hires, equipment rentals, and materials purchases, and typically result in increased local spending by construction workers. The effect a major freeway has on property values is highly variable. Some owners experience increases in values because of enhanced accessibility while others experience decreased values, perhaps because of the negative effects (such as increased noise levels) associated with being near major transportation corridors.

Economic growth in Surprise and Goodyear is partially based on the improved mobility and commercial development opportunities potentially provided by a major north–south transportation corridor serving their communities. Construction of the proposed SR 303L improvements and drainage facilities would likely provide economic stimulus to the region.

Selection of the No-Build Alternative would adversely affect Study Area economic conditions because of increased traffic congestion on arterial streets and on US 60. Lack of adequate transportation infrastructure in the central portion of the Study Area would retard or possibly preclude commercial and industrial development under the noise contour of Luke AFB. Increased traffic on arterial streets would eventually necessitate these streets being widened to accommodate travel demand. These costs would have to be undertaken by local jurisdictions—costs now neither scheduled nor budgeted. Increased traffic congestion would mean addressing—at the local level—the costs of mitigating increased noise levels and air pollution. Because of side streets and driveway openings along arterial streets, noise barriers would likely not be feasible—economically or practicably.

N. Section 4(f) and Section 6(f) Resources

Section 4(f) of the U.S. Department of Transportation Act of 1966 (as amended) states that the Secretary of Transportation “may approve a transportation program or project ... requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if—1) there is no prudent and feasible alternative to using that land; and 2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use” (49 U.S.C. § 303).

A “use” of a Section 4(f) resource, as defined in Title 23 C.F.R. § 774.17, occurs:

- (i) When land is permanently incorporated into a transportation facility;
- (ii) When there is a temporary occupancy of land that is adverse in terms of the statute’s preservation purposes...; or
- (iii) When there is a constructive use of a Section 4(f) property...

A constructive use of a Section 4(f) resource occurs when the transportation project does not incorporate land from the Section 4(f) resource, but the project’s proximity impacts “are so severe that the protected activities, features, or attributes that qualify a resource for protection under section 4(f) are substantially impaired” [23 C.F.R. § 774.15(a)]. For example, a constructive use can occur when:

- The projected noise level attributable to a project substantially interferes with the use and enjoyment of a noise-sensitive facility of a resource protected by Section 4(f). FHWA has defined this noise level as 67 dBA or above.
- The proximity of a proposed project substantially impairs aesthetic features or attributes of a resource protected by Section 4(f), where such features or attributes are considered important contributing elements to the value of the resource. Examples of such an adverse effect would be a transportation facility that obstructs or eliminates the primary views of an architecturally significant historical building, or a transportation facility that substantially detracts from the setting of a park or historic site that derives its value, in substantial part, from its setting.
- A proposed project results in a restriction on access that substantially diminishes the utility of a significant publicly owned park, recreation area, or historic site.

In addition to the Section 4(f) legislation, Section 6(f) of the Land and Water Conservation Fund Act (LWCFA), administered by the Interagency Committee (IAC) for Outdoor Recreation and the U.S. Department of the Interior's National Park Service (NPS), pertains to transportation projects that may affect or permanently convert outdoor recreational property acquired with LWCFA assistance. The LWCFA established the Land and Water Conservation Fund (LWCF), a fund-matching assistance program providing grants paying half the acquisition and development cost of outdoor recreational sites and facilities. Section 6(f) of the act prohibits the conversion of property acquired or developed with these grants to a nonrecreational purpose without approval from IAC and NPS. NPS must ensure that replacement land of equal value, location, and usefulness is provided as condition of approval for land conversions (16 U.S.C. §§ 4601-4 through 4601-11).

This section presents the results of an evaluation examining potential use of public recreational land and historic resources. There are no wildlife or waterfowl refuges in the Study Area. Additionally, there are no properties that used LWCF grants [Section 6(f) properties] in the Study Area. This section provides:

- a description of each Section 4(f) resource within 0.25 mile of the Study Area
- a discussion of direct and constructive uses
- measures available to minimize impacts, when warranted

The Study Area is located near two NRHP-eligible historic properties, a park, and school recreational amenities afforded protection under Section 4(f). However, there are no direct or constructive uses of Section 4(f) properties associated with this proposed project. Therefore, measures to minimize harm are not necessary.

1. Existing Conditions and Environmental Consequences

There are no wildlife or waterfowl refuges that would be eligible for Section 4(f) protection within 0.25 mile of the Study Area. There are, however, two historic properties, a park, and portions of outdoor recreational amenities associated with a public school that would be eligible for Section 4(f) protection within 0.25 mile of the Study Area. For a summary of recreational resources excluded from Section 4(f) protection, see Appendix F, *Section 4(f) Information*.

Preferred Alternative

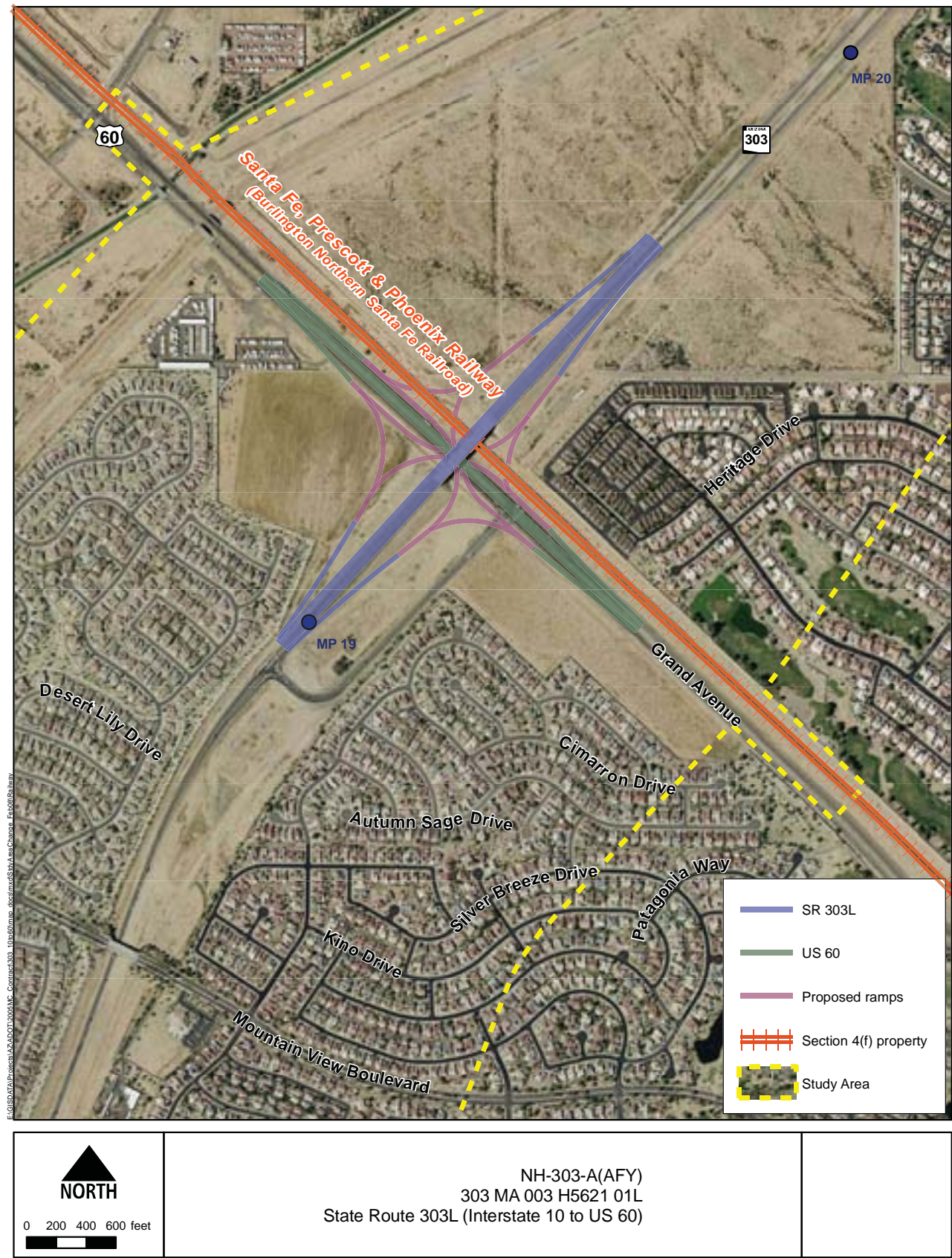
Historic Properties

Historic properties eligible for inclusion in the NRHP under Criteria A, B, or C are eligible for protection under Section 4(f). Historic properties eligible for the NRHP under Criterion D that warrant preservation in place are also eligible as Section 4(f) properties. Two historic properties have been identified within 0.25 mile of the Study Area and are described below (for additional information, refer to Part 4, Section J, *Cultural Resources*, on page 130).

Santa Fe, Prescott & Phoenix Railway. The Santa Fe, Prescott & Phoenix Railway, now owned by BNSF, parallels US 60 in the northern portion of the Study Area (see Figure 4-7, on page 166). The railway is NRHP-eligible under Criterion A.

- Direct Use – The Preferred Alternative would not affect the Santa Fe, Prescott & Phoenix Railway because the ramps would be depressed under the railway. The railway would be temporarily rerouted during project construction, but this would not result in impacts on the qualities that make the railway NRHP-eligible (the SHPO concurrence date is October 16, 2006).
- Constructive Use – The Preferred Alternative would not result in proximity impacts on this Section 4(f) resource. The Santa Fe, Prescott & Phoenix Railway does not have noise-sensitive activities or viewshed characteristics that contribute to its importance as a Section 4(f) resource. Therefore, no further analysis of these proximity impacts to determine whether they would substantially impair the resource is necessary (23 C.F.R. § 774.15).
- Measures to Minimize Harm – Because the Preferred Alternative would not result in direct or constructive use of the Santa Fe, Prescott & Phoenix Railway, Section 4(f) does not require measures to minimize harm.

Figure 4-7. Santa Fe, Prescott & Phoenix Railway



Roosevelt Canal. The Roosevelt Canal is located in the southern portion of the Study Area (see Figure 4-8, on page 168). The Roosevelt Canal is owned and operated by the RID. Within the Study Area, the Roosevelt Canal retains integrity and is eligible for the NRHP under Criterion A (the SHPO concurrence date is October 16, 2006).

- Direct Use – The Preferred Alternative would not affect the Roosevelt Canal because the canal is currently contained in a box culvert under Cotton Lane. The Preferred Alternative would not affect the characteristics that contribute to the Roosevelt Canal’s NRHP-eligibility.
- Constructive Use – The Preferred Alternative would not result in constructive use of this Section 4(f) resource. The Roosevelt Canal does not have noise-sensitive activities or viewshed characteristics that contribute to its importance as a Section 4(f) resource. Therefore, no further analysis of these proximity impacts to determine whether they would substantially impair the resource is necessary (23 C.F.R. § 774.15).
- Measures to Minimize Harm – Because the Preferred Alternative would not result in direct or constructive use of the Roosevelt Canal, Section 4(f) does not require measures to minimize harm.

Figure 4-8. Roosevelt Canal



Parks and Recreational Amenities

Publicly owned parks and recreational amenities are eligible for protection under Section 4(f) if their primary purpose is recreation and they are available for walk-on public use. Walk-on use implies that members of the public do not have to make arrangements with park or school officials prior to use of the recreational amenities (after school hours for amenities located on school grounds). A public park and portions of a public school's outdoor recreation areas meeting these criteria have been identified within 0.25 mile of the Study Area. Current information indicates that there are no planned parks or schools within 0.25 mile of the Study Area.

La Cañada Village Park. La Cañada Village Park is a 1-acre neighborhood park located at 1489 North 181st Avenue in Goodyear. The park, owned by the City of Goodyear, is found in the center of the La Cañada Village mobile home park. Park amenities include a basketball court, play structure, and picnic ramada. The park is accessible from 181st Street and 180th Lane (see Figure 4-9, on page 170).

- **Direct Use** – The Preferred Alternative would not affect La Cañada Village Park because the park is 425 feet from the edge of I-10 and 1.23 miles from Cotton Lane. The ramps for the I-10/SR 303L system traffic interchange would be at least 25 feet from the existing sound barrier located between I-10 and the La Cañada Village Park mobile home community.
- **Constructive Use** – The Preferred Alternative would not result in constructive use of this Section 4(f) resource. La Cañada Village Park does not have noise-sensitive activities or viewshed characteristics that contribute to its importance as a Section 4(f) resource. Therefore, no further analysis of these proximity impacts to determine whether they would substantially impair the resource is necessary (23 C.F.R. § 774.15). Existing access to the Section 4(f) property would not be altered; therefore, access to the resource would not be impaired
- **Measures to Minimize Harm** – Because the Preferred Alternative would not result in direct or constructive use of La Cañada Village Park, Section 4(f) does not require measures to minimize harm.

Figure 4-9. La Cañada Village Park



Desert Thunder Elementary School. Desert Thunder Elementary School is located in Goodyear. This publicly owned school is under the jurisdiction of the Avondale Elementary School District. Desert Thunder Elementary School is located on two parcels. Most of the school buildings are located on the southern parcel. Recreational amenities on this southern parcel are fenced and locked after school hours and not available for walk-on public use. Therefore, the recreational amenities on the southern parcel are not Section 4(f) resources.

The parcel to the north contains a baseball diamond, play structure, general-purpose field, and ramada. This parcel is not fenced and is considered a Section 4(f) resource. This northern parcel of Desert Thunder Elementary School is accessible from Garfield Street or 167th Avenue (see Figure 4-10, on page 172).

- Direct Use – The Preferred Alternative would not affect Desert Thunder Elementary School because the school is approximately 0.25 mile from I-10, 900 feet from the nearest I-10/SR 303L system traffic interchange ramp, and 0.3 mile from Cotton Lane.
- Constructive Use – The Preferred Alternative would not result in constructive use of this Section 4(f) resource. Desert Thunder Elementary School does not have noise-sensitive activities or viewshed characteristics that contribute to its importance as a Section 4(f) resource. Therefore, no further analysis of these proximity impacts to determine whether they would substantially impair the resource is necessary (23 C.F.R. § 774.15). Existing access to the Section 4(f) property would not be altered; therefore, access to the resource would not be impaired.
- Measures to Minimize Harm – Because the Preferred Alternative would not result in direct or constructive use of Desert Thunder Elementary School, Section 4(f) does not require measures to minimize harm.

Figure 4-10. Desert Thunder Elementary School



No-Build Alternative

Under the No-Build Alternative, no impacts on Section 4(f) properties would occur because no transportation project with federal funding would be implemented.

2. Mitigation Measures

There are no direct or constructive uses of Section 4(f) properties associated with this project. Therefore, measures to minimize harm would not be necessary.

3. Coordination

On January 11 and June 24, 2008, scoping letters and Section 4(f) questionnaires were sent to public entities that could have Section 4(f) properties within the Study Area. The following subsections list the scoping letter recipients and summarize responses to date. Appendix F, *Section 4(f) Information*, contains examples of the letter and questionnaire sent to cities, other governmental agencies, and school districts.

Cities and Other Governmental Agencies

- City of Glendale
- City of Goodyear
- City of Surprise
- Maricopa County Parks and Recreation Department

School Districts

- Agua Fria Union High School District
- Avondale Elementary School District
- Dysart Unified School District
- Litchfield Elementary School District

Scoping Responses

Dysart Unified School District

On January 31, 2008, the Dysart Unified School District responded to the scoping letter by stating that Cimarron Springs Elementary School, Canyon Ridge School, Willow Canyon High School, Sonoran Heights Elementary School, Sunset Hills Elementary School, and School #19 are in the

SR 303L Study Area. Using the district-provided Maricopa County Assessor parcel numbers, it was determined that only Cimarron Springs Elementary School is within the Study Area. An after-hours field visit to the Dysart Unified School District's schools revealed that the school grounds were fenced and locked. District officials, however, indicated that this is against district policy and that they would ensure that the school grounds are available for walk-on public use.⁶ On March 18, 2008, during a follow-up visit to Cimarron Springs Elementary School after school hours, it was discovered that the school grounds were still locked and not available for the public's walk-on recreational use.

The school district also indicated four planned schools would be built in the Study Area; they are designated Sara Anne Ranch, Sycamore Farms, Woolf property, and Prasada. According to the school district, only the Sara Anne Ranch property—which is outside the Study Area—is currently owned by the school district. Because the other properties are not currently publicly owned, they are not eligible for Section 4(f) consideration at this time.

Litchfield Elementary School District

On January 23, 2008, the Litchfield Elementary School District responded that it has no existing or planned schools in the Study Area.

4. Conclusion

The Preferred Alternative would be located near two NRHP-eligible historic properties afforded protection under Section 4(f)—the Santa Fe, Prescott & Phoenix Railway and Roosevelt Canal. It would also be located near one publicly owned park, La Cañada Village Park, and one school with recreational amenities available to the public for walk-on use, Desert Thunder Elementary School. No direct or constructive use of these properties would occur under the Preferred Alternative.

The No-Build Alternative would not affect Section 4(f) properties in the Study Area because no transportation project with federal funding would be implemented.

⁶ personal communication with Vern Wolfley, Senior Planner at Dysart Unified School District, on February 25, 2008

O. Utilities

This section contains information related to existing utilities that may be affected as a result of implementing the proposed improvements.

1. Existing Conditions

Several utilities are parallel to, within, or perpendicular to the SR 303L corridor. These utilities include telephone lines, fiber optic lines, natural gas lines, electrical facilities, cable, water lines, sewer lines, and groundwater wells. Most of the utility crossings are located at the major section-line roads. Table 4-21, on this page, lists existing utility owners (not including groundwater wells) and facility locations. Additionally, utilities are being installed at several locations, mainly at the Cactus Road and Waddell Road intersections with SR 303L. Information regarding water resources in the Study Area (groundwater wells, irrigation districts and their conveyance infrastructure) may be found in Part 4, Section B, *Water Resources* (on page 71).

Table 4-21. Existing utilities

Company	Utility type	Location
Arizona American Water	Water (8- to 16-inch line)	Mountain View Boulevard, Clearview Boulevard, 0.5 mile north of Greenway Road, Greenway Road
Arizona Public Service	Power (overhead)	US 60 ^a , Clearview Boulevard, Greenway Road, Waddell Road, Peoria Avenue, Cactus Road, Olive Avenue, Northern Avenue, 0.5 mile south of Glendale Avenue, Camelback Road, Indian School Road, Thomas Road, Cotton Lane, McDowell Road
	Power (underground)	Bell Road
Broadwing Communications	Fiber optic (underground)	Cotton Lane
City of Goodyear	Sewer	McDowell Road from Arizona State Prison Complex-Perryville
City of Surprise	Sewer	Bell Road, 0.25 mile south of Bell Road
Cox Communications	Cable TV (underground)	Mountain View Boulevard, Clearview Boulevard, Bell Road, Northern Avenue
Qwest	Telephone Fiber optic	US 60, Clearview Boulevard, Bell Road, Waddell Road, Northern Avenue, Glendale Avenue, Bethany Home Road, Indian School Road, McDowell Road
Southwest Gas	Natural gas	US 60, Mountain View Boulevard, Clearview Boulevard, Bell Road, Waddell Road, Indian School Road, Van Buren Street
Verizon Business	Fiber optic (underground)	US 60

^a United States Route 60

Most of the power lines that would cross the proposed freeway cross the existing SR 303L now at arterial cross streets and are mounted on wooden poles, with the exception of Bell Road, where the power lines are underground.

The City of Surprise has a 15-inch sewer running along the north side of Bell Road at the existing SR 303L and a 15-inch bypass sewer crossing the highway between Bell Road and Greenway Road.

Approximately 12 miles of the proposed SR 303L improvements within the 18-mile-long Study Area would pass through agricultural land in active cultivation. These fields use irrigation water delivered by a system of ditches and pipes. Continuous use of the water delivery facilities is important to farmers and other landowners because even a short interruption of service could be detrimental to crops. The existing RID main canal crosses the proposed SR 303L alignment several hundred feet south of I-10 and crosses I-10 east of SR 303L. The canal is the main irrigation water delivery source for the RID's landowners. Existing agricultural facilities include irrigation pipes, concrete and earthen irrigation ditches, tailwater ditches, groundwater wells and pumps, tailwater sumps, and irrigation appurtenances.

BNSF owns and operates the branch railroad line running along the northern side of US 60 and the Ennis Spur, which crosses the existing SR 303L at Olive Avenue. The branch line connects the Phoenix metropolitan area with the main east–west line to California and northern Arizona. BNSF requires 25 feet of clearance on the outside of its tracks. The total desired continuous clear R/W is 100 feet. Generally, one outbound and one inbound train use the Ennis Spur across SR 303L each day—a usage rate not expected to change in the near future.

As future development occurs along the SR 303L corridor, new utilities would be needed to serve new developments. In particular, trunk sewers and domestic water mains would be needed at most of the cross streets. Additional underground telephone, gas, and cable facilities would be needed at many of the cross streets as well. Coordination with the local governments, utility providers, and developers would be necessary as residential and commercial development continues in the corridor.

Some future utilities have already been planned. These include new water mains proposed by Citizens Water Company at the northern end of the corridor and by Litchfield Park Service Company at the southern end of the corridor. The City of Surprise has indicated that trunk sewer lines are likely at each of the arterial street crossings within the city. Additional overhead or underground electric power lines would also be needed. Arizona Public Service has sited a new 230 kilovolt (kV) overhead power line in the Cotton Lane corridor west of SR 303L. The line, as proposed by Arizona Public Service, would parallel SR 303L from Olive Avenue to Cactus Road (2 miles), then turn west along Cactus Road. If the Preferred Alternative were to be selected, design of these utilities would be coordinated with the future SR 303L improvements.

2. Environmental Consequences

Preferred Alternative

Under the Preferred Alternative, many existing utilities would need to be relocated prior to project construction. The proposed drainage channel along the west side of SR 303L would require relocation of most of the underground utilities that cross the channel. The depressed portion of the freeway would require relocation of all existing utilities in the section of the freeway between Greenway Road and Bell Road. Discussions of options for relocating or diverting a 15-inch sewer crossing at Bell Road have begun with the City of Surprise. The diversion sewer that crosses SR 303L south of Bell Road would not need to be relocated because the highway profile would be designed to pass above this sewer line. Coordination is underway with the City of Goodyear regarding rerouting an 18-inch sewer pipe that comes in from the west along McDowell Road and steps up to a 24-inch pipe at Cotton Lane as it progresses east. While the sewer pipe is 12 feet deep, it would be exposed if the proposed improvements were constructed because SR 303L is planned to be depressed under McDowell Road. Another sewer pipe associated with the prison complex would need to be reconstructed and should be combined with any new diversion.

Because few alternatives are available to the scheduled and continuous delivery of irrigation water, coordination with users of the irrigation water during construction of the roadway would be extremely important to prevent crop damage. Irrigation districts serving Study Area farmers and other landowners are the Maricopa County Municipal Water Conservation District, Adaman Irrigation and Water Delivery District, and RID.

Power lines crossing SR 303L would have to be relocated and/or raised. Three 69-kV overhead transmission lines that now cross SR 303L at McDowell Road, Thomas Road, and US 60 would have to be realigned and provisions would need to be made to establish sufficient clearance over the proposed freeway. At the I-10 system traffic interchange, the 69 kV transmission lines that run north-south parallel to Cotton Lane may have to be rerouted around the interchange because of the complexity and size of the interchange. Alternatively, the power lines could be buried beneath the north-south frontage roads.

ADOT would coordinate with the appropriate utility companies regarding utility adjustments and any service disruptions. The ADOT Utility and Railroad Engineering Section would further investigate utility involvement to coordinate the need for relocation and the accommodation of utilities with the proposed improvements. Any construction on BNSF tracks would be performed by BNSF and should be completed prior to highway construction. BNSF may need 2 years to complete its work.

Prior rights investigations would need to be conducted to determine the responsible party for utility relocations. BNSF, Arizona American Water, Verizon Business, and the City of Goodyear may have prior rights. Other than BNSF, each should be relocated during construction. Temporary service interruptions could be expected and would be addressed during the final design stage.

No-Build Alternative

No impacts on utilities would occur with the selection of the No-Build Alternative. However, future street improvements accompanying foreseeable development may affect utilities in the Study Area.

3. Mitigation Measures

- The ADOT Utility and Railroad Engineering Section would coordinate utility involvement.
- During final design, BNSF would be afforded the opportunity to comment on design plans.

4. Conclusion

Selection of the Preferred Alternative would require utility relocation. Under the Preferred Alternative, the ADOT Utility and Railroad Engineering Section would further investigate utility involvement to coordinate the need for relocation and the accommodation of utilities with the proposed improvements.

No impacts on utilities would occur under the No-Build Alternative. However, future street improvements accompanying foreseeable development may affect utilities in the Study Area.

P. Material Sources and Waste Materials

This section describes the material sources needed for the proposed improvements to SR 303L and the handling of waste materials potentially generated by the improvements.

1. Existing Conditions and Environmental Consequences

Preferred Alternative

More than 13 million cubic yards of excavated material would be generated by construction of the depressed freeway segments and drainage channels/retention basins associated with implementing the Preferred Alternative. No borrow sources are expected to be required for the embankment material needed for the freeway overpasses and ramps. Excavated materials from depressed roadway sections and drainage features would be used for freeway and overpass fill requirements. The design goal would be to balance the earthwork so that no waste site would be required.

No-Build Alternative

Under the No-Build Alternative, no improvements would be constructed. Therefore, no material sources would be needed and no waste materials would be generated. Eventual development of Study Area land would likely mean expansion of the existing street network and widening of some streets. Material sources needs and waste management concerns would accompany such improvements to the local street system.

2. Mitigation Measures

The contractor would refer to ADOT's *Standard Specifications for Road and Bridge Construction* (2000b) for mitigation measures regarding materials sources and materials disposal.

3. Conclusion

Under the Preferred Alternative, the design goal would be to balance the earthwork so that no borrow materials or waste disposal sites would be needed.

Under the No-Build Alternative, no new freeway would be constructed and, therefore, no materials sources would be needed and no waste materials would be generated. Eventual development of Study Area land would likely mean expansion of the existing street network and widening of some streets. Material sources needs and waste management concerns would accompany such improvements to the local street system.

Q. Secondary Impacts

The direct impacts of actions such as highway construction projects are usually easy to identify, describe, quantify, and mitigate (if needed). However, an action may induce other secondary and cumulative impacts that are perhaps less obvious, difficult to quantify, additive in nature, or long-term in occurrence and effect. This section identifies the likely, foreseeable secondary impacts that would result from the construction of the proposed freeway. Cumulative impacts are addressed in the following section.

FHWA is required to implement NEPA and the Council on Environmental Quality (CEQ) guidelines under 23 C.F.R. Part 771 (FHWA 1992). FHWA has developed interim guidance on the analysis of indirect and cumulative impacts (FHWA 2003b), which supplements the CEQ guidance. Combined, these documents provide the primary basis for analysis.

The classification of secondary and cumulative impacts, in accordance with FHWA guidance, is presented in Table 4-22, on this page.

Table 4-22. Secondary and cumulative impacts classification

Impact category	Impact classification	Description
Type	Neutral, positive, or negative	Compares the final condition of a given resource with its existing condition (assumes that the expected impact occurs); impacts on personal property are considered negative
Severity	Minor, moderate, or substantial	Considers the relative contribution of the proposed action to a given impact
Duration	Temporary or permanent	“Permanent” is assumed unless otherwise specified

Sources: Federal Highway Administration (1992 and 2003b)

1. Existing Conditions

The SR 303L Study Area is about 18 miles long and 1 mile wide, at the edge of the rapidly expanding cities of Goodyear and Surprise (at the southern and northern ends of the corridor, respectively). In addition to the Pebble Creek development (in the south) and the Sun City Grand development (in the north), numerous additional developments are planned or underway throughout the Study Area. For example, a large residential and commercial development is proposed at the planned junction of SR 303L and the proposed Northern Parkway, and at the intersections of Cactus and Waddell roads with SR 303L.

Remarkable growth in both population and employment is projected within the SR 303L corridor over the next three decades. The population is expected to grow by 169 percent, from just over 146,000 in 2005 to nearly 394,000 by 2030 (MAG 2007c).⁷ The central portion of the Study Area currently lacks the transportation facilities and infrastructure necessary to adequately accommodate this growth.

2. Environmental Consequences

Secondary impacts are reasonably foreseeable consequences of the action, but are later in time or farther removed in distance. Secondary impacts “may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems” (40 C.F.R. § 1508.8).

The relationship of the proposed freeway to social, cultural, economic, and natural components of the environment was reviewed to determine the potential for secondary impacts. Based on this assessment, it was determined that critical resources warranting secondary impact analysis are population, land use, land value, and tax base.

Preferred Alternative

The expected secondary effects of the improvements to SR 303L would be the acceleration of population growth and urbanization of the corridor. The MAG *Socioeconomic Projections of Population, Housing and Employment by Municipal Planning Area and Regional Analysis Zone* (2007c) indicate that the Study Area population will likely increase from about 146,000 to almost 394,000 between 2005 and 2030. The region is rapidly growing today without a full freeway facility in place; however, improved transportation facilities would likely generate more interest in citizens to live and work in the West Valley, which would lead to increasing urbanization in the Study Area. This would be a minor and neutral secondary impact.

Expected secondary effects of the improvements to SR 303L would be an increase in land values and the corresponding tax base resulting from improved access. Approximately 960 acres of land (including 800 acres of farmland) would be removed from tax rolls for new R/W and drainage facilities related to the proposed project, resulting in a minor direct impact on the agricultural land tax base. While it is recognized that the effect a major highway has on property values may be

⁷ The Study Area population was estimated based on MAG’s municipal planning area regional analysis zones (212, 220, 221, 232, 233, 254, 265, and 280). The MAG 2007 report includes existing population for 2005 and population estimates for 2010, 2020, and 2030.

highly variable, the secondary effects of the Preferred Alternative would be minor and positive, resulting from improved access.

No-Build Alternative

Under the No-Build Alternative, the Study Area's population growth and urbanization would continue, but it may not grow as rapidly without the proposed SR 303L improvements to generate more attractiveness for citizens to live and work in the West Valley.

3. Mitigation Measures

Because the proposed improvements to SR 303L would result in a minor and neutral impact on population growth and urbanization, no mitigation measures would be necessary. Likewise, mitigation measures would not be necessary to relieve secondary impacts on land values and tax base because these impacts would be minor and positive.

4. Conclusion

Under the Preferred Alternative, a minor, neutral secondary impact on population growth and land use would be expected as a result of improvements to SR 303L, which would generate more interest among citizens, businesses, and industries that may choose to relocate to the Study Area to take advantage of upgraded transportation facilities. A minor, positive secondary impact on land values and the tax base would occur.

Under the No-Build Alternative, expected population growth and urbanization would continue, although perhaps at a slower rate than under the Preferred Alternative.

R. Cumulative Impacts

Cumulative effects are the combined impacts on the environment that result from the incremental effect of the proposed action when added to past, present, or reasonably foreseeable future actions, regardless of what agency or person is responsible for those future actions. For this Draft EA, past actions are those considered to have occurred since 1985, and foreseeable future actions are based on the best available information from the associated planning agencies.

1. Existing Conditions

The most influential past, present, and future actions related to the proposed improvements are the growth and development of Goodyear, Glendale, and Surprise and unincorporated Maricopa County land in the Study Area. The results of this growth are likely to be a larger population, higher growth rates, more employment opportunities, increased tax revenue for the jurisdictions, and more rapid conversion of farmland to urban uses. The general change from rural farmland to urban residential communities would likely broaden the composition of the area's social and economic characteristics.

Current and ongoing development was noted in Part 4, Section A, *Land Ownership, Jurisdiction, and Land Use*, on page 62. Numerous PADs are well under way, including Sarival Gardens, Cotton Flower, Canyon Trails Ranch, Pebble Creek, Clearwater Farms, Sierra Montana, Surprise Farms, Northwest Ranch, Bell West Ranch, Sycamore Farms, Sun City Grand, and Sun City West. Cactus Lane Ranch is a proposed subdivision within the corridor. These PADs would rely on the area's transportation system and, specifically, SR 303L to serve as a primary regional connector to the developments.

Other transportation corridors near SR 303L that are undergoing improvements or have planned future improvements include:

- Cotton Lane, the continuation of SR 303L south of I-10, is planned to be extended south of MC 85, across the Gila River to Estrella Mountain Parkway (MCDOT project).
- SR 303L is in the MAG RTP for not only the proposed improvements covered by this Draft EA, but also the construction of a freeway south of I-10 to connect to the proposed SR 801 (ADOT project). The RTP also authorizes the study of another segment of SR 303L extending south of the proposed SR 801 to Riggs Road. The RTP authorizes acquisition of R/W for this segment, but funding for construction of this additional segment has not been identified.

- Improvements to SR 303L are being designed to extend the route north and east of US 60 to I-17 to create a regional “beltway” around the West Valley (ADOT project).
- I-10, from SR 303L to SR 101L, is also planned to be widened substantially to meet future travel demand (ADOT project).
- Northern Parkway was recently added to the list of major transportation facilities. The parkway would be substantially upgraded between US 60 and SR 303L to become the Northern Parkway (a MCDOT, Glendale, and Peoria project).
- US 60 is already undergoing major modifications west of SR 303L to provide a four-lane divided facility from SR 303L to Wickenburg. Widening between 83rd Avenue and SR 303L is also programmed and under design.
- Numerous arterial streets are currently being upgraded by local jurisdictions in conjunction with new residential and commercial development. Over time, most of the 1-mile-grid streets crossing or paralleling SR 303L would be converted from rural two-lane roads to four-lane urban arterial streets.

2. Environmental Consequences

Preferred Alternative

The proposed improvements to SR 303L and other transportation corridors near the Study Area are part of approved transportation plans, including the voter-approved MAG RTP. Although the proposed SR 303L improvement project would not displace any residents, other projects in the corridor could be expected to displace existing residents, businesses, and utilities and alter access to existing land uses.

The following resource areas are discussed for cumulative impacts: economic conditions, utilities, land use, noise levels, biological resources, farmland, water resources, and cultural resources.

Economic Conditions

Some businesses would be affected by R/W acquisition or experience a loss of parking. However, businesses would also take advantage of and benefit from the expected growth and higher-capacity transportation system provided, in part, by SR 303L. Overall, this would be a minor, positive cumulative economic impact.

Utilities

Current and ongoing development would increase demand for utility services within the Study Area. Planned transportation improvements, including the proposed SR 303L improvements, would require the relocation of existing utilities and coordination with utility owners regard future utility locations near the Study Area. ADOT would coordinate with utility owners regarding required relocations, timing of relocations for overlapping transportation improvements, and potential service interruptions. The utility relocations and temporary service interruptions would constitute a minor, negative cumulative impact.

Land Use

While other transportation projects in the corridor may change access to adjacent land uses, in most cases, new forms of access would be provided to accommodate existing land uses. For those properties where development of the proposed improvements would entirely sever access, the relevant agency would acquire the properties, compensating property owners at fair market value. The improvements to SR 303L and other transportation corridors would, overall, provide improved accessibility to major activity centers. SR 303L would support growth and its associated travel demand and provide capacity for projected growth trends. This would result in a minor, positive cumulative impact.

Noise Levels

With the increase in urban development and construction of planned transportation improvements, including the proposed improvements to SR 303L, ambient noise levels would increase. The increase in noise levels related to planned transportation improvements could be mitigated to meet ADOT and FHWA standards. The increase in noise levels would be a minor, negative cumulative impact.

Biological Resources

Almost no natural habitat remains in the SR 303L corridor between I-10 and US 60. North of US 60, some natural habitat remains. Historical, current, and future development collectively add to the permanent loss of indigenous vegetation and habitat. Construction of the Preferred Alternative would minimally contribute to the cumulative loss of existing vegetation and wildlife habitat. This would constitute a minor, negative cumulative impact.

Prime and Unique Farmland

Throughout the Study Area, there are extensive agricultural operations. The majority of the R/W needed for the proposed SR 303L project and many of the noted regional transportation projects would come from farmland. Throughout the Phoenix metropolitan area, farmland is being converted to urban uses. This project would contribute to that trend, resulting in a minor, negative cumulative impact. Coordination with NRCS regarding the loss of farmland was completed, and it was determined that prime and unique farmland in the Study Area does not warrant protection under the FPPA. Preservation of agricultural land uses around Luke AFB is important to protecting efficient aircraft operations at the base. As noted earlier, efforts are under way by other jurisdictions to protect Luke AFB from encroaching urban development. This project would complement that protection by incorporating retention basins on land south and west of the runway.

Water Resources

For water resources, the most notable cumulative impacts would be the loss of permeable surface area to absorb stormwater flow and the related increase in quantity and decrease in quality of surface water runoff from continued development in the area. However, the mitigation measures associated with this proposed project and the FCDMC ADMP would result in a minor, negative cumulative impact on water resources.

Cultural Resources

Development impacts on the cultural environment also contribute to cumulative impacts. No adverse impacts would be anticipated for historic canals or railroads crossed by SR 303L or the outfall channel. However, the Morocco Ruin, an NRHP-eligible archaeological site, would be affected by a MCDOT project at Cotton Lane. Archaeological mitigation work (data recovery) is under way at the portion of the site within the MCDOT study area. Testing and data recovery would likely be required for the outfall channel-related impacts associated with the current project and, therefore, would result in an additional cumulative impact on the site as a whole. This would constitute a minor, negative impact.

Summary of Impacts

A summary of the cumulative impacts of the Preferred Alternative is presented in Table 4-23, on page 187.

Table 4-23. Summary of cumulative effects

Resource	Past actions	Present actions	Proposed actions	Future actions	Cumulative effect
Economic conditions	Development has occurred, resulting in increasing demand for services and revenue for businesses and municipalities.	Ongoing development is expected to increase the demand for services and revenue for businesses and municipalities.	Construction of the proposed project would affect some businesses through R/W ^a acquisitions and loss of parking.	Projected development would continue the demand for services and, thus, increase revenue for businesses and municipalities.	Extensive development in the area, coupled with the proposed improvements, would result in positive economic impacts.
Utilities	Development has occurred, resulting in increasing demand for utility services within the Study Area.	Ongoing development is expected to increase demand for utility services within the area.	Construction of the proposed project would require relocation of some existing utilities.	Projected development would continue the demand for utility services within the area.	Extensive development in the area, coupled with the proposed improvements, would result in a minor, negative cumulative impact on utilities.
Land use	Development has occurred.	Ongoing development is occurring and proposed.	Construction of the proposed project would not have adverse impacts on land use related to continued future development.	Projected development would result in major changes to land use as the area urbanizes.	Extensive development in the area would result in major changes to land use as the area urbanizes. The proposed project would be a response to increasing traffic volumes and would address the need for improved traffic flow within the area. The proposed project is not considered a cause of projected development. The improved traffic capacity would result in a minor, positive cumulative impact.
Noise levels	Development has occurred, which contributes to ambient noise levels within the Study Area.	Ongoing development is expected to contribute to increases in ambient noise levels within the Study Area.	Construction of the proposed project would contribute to increases in ambient noise levels along the project corridor.	Projected development would contribute to increases in ambient noise levels within the Study Area.	With the increase in urban development and construction of the proposed improvements to SR 303L, ambient noise levels would increase. The increase in noise levels would be a minor, negative cumulative impact.
Biological resources	Development has occurred, which has contributed to the loss of vegetation and wildlife habitat.	Ongoing development is expected to contribute to the loss of vegetation and wildlife habitat.	Construction of the proposed project would contribute to the loss of vegetation and wildlife habitat located north of US 60.	Projected development would contribute to the loss of vegetation and wildlife within the Study Area.	The increase in urban development and the construction of the proposed improvements to SR 303L would collectively contribute to the cumulative loss of vegetation and wildlife habitat within the Study Area. This urbanization trend constitutes a minor, negative cumulative impact.
Prime and unique farmland	Development has occurred, which has contributed to the conversion of farmland to urban uses.	Ongoing development is expected to contribute to the conversion of farmland to urban uses.	Construction of the proposed project would contribute to the conversion of farmland to urban uses. However, the prime and unique farmland within the Study Area does not warrant protection under the Farmland Protection Policy Act.	Projected development would contribute to the conversion of farmland to urban uses.	The increase in urban development and construction of the proposed improvements to SR 303L would collectively contribute to the continued loss of farmland within the Study Area. This trend of farmland being converted to urban uses constitutes a minor, negative cumulative impact.
Water resources	Development has occurred, which has contributed to the loss of permeable surface areas to absorb stormwater flow. It has also contributed to the related increase in quantity and decrease in quality of surface water runoff.	Ongoing development is expected to contribute to the loss of permeable surface areas to absorb stormwater flow. It would also contribute to the related increase in quantity and decrease in quality of surface water runoff.	Construction of the proposed project would contribute to the loss of permeable surface areas to absorb stormwater flow. It would also contribute to the related increase in quantity and decrease in quality of surface water runoff.	Projected development would contribute to the loss of permeable surface areas to absorb stormwater flow. It would also contribute to the related increase in quantity and decrease in quality of surface water runoff.	The increase in urban development and construction of the proposed SR 303L project would contribute to the loss of permeable surface area to absorb stormwater flow. They would also contribute to the related increase in quantity and decrease in quality of surface water runoff. This is considered a minor, negative cumulative impact.
Cultural resources	Development has occurred, which has contributed to the continuing loss of cultural resources within the Study Area and the region as a whole.	Ongoing development is expected to contribute to the continuing loss of cultural resources within the Study Area and the region as a whole.	While avoidance is recommended for cultural sites, construction of the proposed project may affect properties eligible for, potentially eligible for, or listed in the NRHP ^b .	Projected development would contribute to the continuing loss of cultural resources within the Study Area and the region as a whole.	The increase in development, coupled with planned transportation improvements, would contribute to the loss of cultural resources within the Study Area and the region as a whole. This trend is considered a minor, negative cumulative impact.

^a right-of-way

^b National Register of Historic Places

No-Build Alternative

Under the No-Build Alternative, other planned transportation projects and urban development would continue within and near the Study Area, resulting in cumulative impacts on the previously discussed resources.

3. Mitigation Measures

Disclosure of cumulative impacts does not require ADOT to propose and implement mitigation measures to address such impacts. Project-specific mitigation measures that are proposed to mitigate direct impacts inherently address reductions in such overall impacts. The disclosure of cumulative impacts is provided primarily for information purposes.

4. Conclusion

The Preferred Alternative would result in minor cumulative impacts on the following resource areas: economic conditions, utilities, land use, noise levels, biological resources, farmland, water resources, and cultural resources.

Because other transportation projects and urban development would continue under the No-Build Alternative, cumulative impacts on these same resources would be expected.

S. Summary

Table 4-24, beginning on this page, summarizes the environmental impacts associated with the Preferred Alternative and the No-Build Alternative. This table focuses on resources/issues where there is a difference in the impacts associated with each alternative.

Table 4-24. Summary of environmental impacts

Affected resource/issue	Preferred Alternative	No-Build Alternative
Land use	Right-of-way needed = 960 acres (800 of which would come from agricultural land)	7,200 acres of agricultural land in Study Area to be replaced with other land uses
Water resources	Surface water quality would be affected by sediment loading, runoff of pollutants, and soil erosion	Impacts on surface water quality may occur as urbanization continues
Floodplains	Minor encroachments on floodplains associated with the Roosevelt Canal and Camelback Road	Impacts on floodplains may occur as urbanization continues
Biological resources	Invasive species could be introduced during construction activities	Invasive species could be introduced through continued urban development
Visual resources	Visual character would change with overpasses, ramps, lighting, fencing, medians; system traffic interchange proposed for I-10 ^a /SR 303L ^b would be ~75 feet tall and visible from nearby residential development	Visual character would change as area develops; traffic congestion would limit ability to appreciate distant views
Air quality	Would reduce regional impacts of air quality; potential short-term exceedances for carbon monoxide and particulate matter during construction	Potential short-term exceedances for carbon monoxide and particulate matter during construction as area develops
Noise levels	137 of 143 receivers would exceed ADOT ^c mitigation criteria and be eligible for noise abatement consideration; sensitive receivers would be affected (temporarily) by construction noise if receivers were immediately adjacent to the right-of-way	Lower noise levels at the selected (modeled) receivers than under the Preferred Alternative, but would result in higher noise levels at other locations, such as arterial and neighborhood streets
Social conditions	Emergency services response times would improve, except during construction; alternative transportation modes would benefit from grade-separations with cross streets and less traffic congestion on arterial streets	Additional access to planned commercial areas and neighborhoods would not be built, adversely affecting area's economic potential; selection of this alternative would not comply with proposed or adopted development plans for the Study Area

(continued on next page)

Table 4-24. Summary of environmental impacts (*continued*)

Affected resource/issue	Preferred Alternative	No-Build Alternative
Economic conditions	<p>Approximately 960 acres of new right-of-way would need to be acquired for the project; 800 acres would be removed from agricultural production and, therefore, from the local tax base (amounts to a small portion of the Study Area's 7,200 acres of agricultural land)</p> <p>Construction would cause short-term adverse impacts on Study Area businesses and travelers; this would be offset by long-term economic benefits deriving from enhanced access, decreased travel times, improved exposure for commercial properties</p> <p>Two business displacements would be required; each would be eligible for ADOT relocation assistance and benefits; one other business may need to be acquired</p> <p>Economic benefits during construction (jobs, material purchases, equipment leasing, construction employee expenditures, related regional multiplier effects)</p> <p>Expenditures on transportation, including capital and operating and maintenance costs, would effect long-term economic benefits to the area and region primarily from improved transportation efficiency</p>	Planned development would continue to reflect high population growth rates and associated land use conversion
Utilities	Many existing utilities would have to be relocated	Impacts on utilities may occur as urbanization continues
Secondary impacts	Rates of population growth and land use conversion would accelerate	Population growth and urbanization would continue, but at a slower rate than with the proposed SR 303L improvements
Cumulative impacts	Minor positive cumulative impacts for economic conditions and land use; minor, negative cumulative impacts for utilities, noise levels, biological resources, farmland, water resources, and cultural resources	Other planned transportation projects and urban development would continue within and near the Study Area

^a Interstate 10^b State Route 303L^c Arizona Department of Transportation^d National Register of Historic Places

Part 5. Public Involvement and Project Coordination

A. Scoping

An extensive agency and public scoping process was implemented to gather input on design alternatives, identify related issues and concerns, and help define environmental issues to be addressed in this Draft EA.

1. Agency Scoping Meeting

An agency scoping meeting was held on May 24, 2001. It was organized by MCDOT to discuss improvements to SR 303L. All stakeholders were invited to attend, including representatives from local, county, state, and federal agencies. Approximately 50 people attended, including representatives from the Cities of Goodyear, Litchfield Park, Glendale, and Surprise; Maricopa County Planning Department; MAG; FCDMC; MCDOT; ADOT; AGFD; the Arizona Department of Commerce; and FHWA. The project team gave a presentation that covered the following items:

- *Loop 303/White Tanks Area Drainage Master Plan*
- Ground subsidence issues
- Utilities
- Roadway elements and three possible interim roadway alternatives that could evolve into the ultimate highway
- Environmental issues
- Community and government relations plan
- Community relations and the Right Roads program

In general, issues and concerns raised at the agency scoping meeting were related to noise impacts, air quality, effects on Luke AFB, traffic interchange needs, induced growth, the need for new funding, and land subsidence.

All of the agencies previously noted and those included in the mailing list in Appendix G, *Agency Correspondence*, were given the opportunity to comment and provide input for consideration in this Draft EA. This input has been considered during project development and addressed to the extent possible. Agency correspondence is included in Appendix G, and agency concerns and comments are summarized in Table 5-1, beginning on page 193.

Table 5-1. Agency scoping meeting comments (May 2001)

Agency	Comment	Response
City of Surprise	Wants assurance that noise pollution will not adversely affect quality of life and health and that noise from vehicles will be below legal levels	The Draft EA ^a includes an analysis of roadway noise impacts in accordance with MCDOT ^b , ADOT ^c , and FHWA ^d guidelines. Specific analysis is found in Part 4, Section H.
	Recommends that cutoff luminaires be used for all lighting intended for Loop 303 to ensure that there is no glare or spillover of light onto citizens' properties	The DCR ^e and design efforts include consideration of light shielding. This issue is discussed in Part 4, Section F.
	Wants assurance that public health is not in jeopardy as it relates to pollution from vehicles	Air quality impacts would result from both the immediate freeway facility and regional sources of pollution. This Draft EA includes an analysis of air quality impacts as a result of the proposed SR 303L ^f . Specifically in Surprise, the intersections of Bell Road/SR 303L and US 60/SR 303L were modeled using ADOT and FHWA guidelines; see Part 4, Section G.
City of Glendale	Supports MCDOT's efforts to prepare the DCR and Draft EA, which would preserve the option for future programming of federal funds for this project	ADOT has joined MCDOT in working to develop this project.
	Recommends traffic interchanges be added at Bethany Home Road and Glendale Avenue	See next item.
	Recommends traffic interchanges at all major arterial streets; initial crossover bridges should allow for conversion to an interchange	The project design has evolved with respect to traffic interchanges. As requested, all major 1-mile cross streets have been addressed and would be provided with grade-separated interchanges (Part 3).
	Would like consideration given to using SPUIs ^g in areas of potential higher traffic demands; future impacts along SR 303L could reflect the level of impacts now being envisioned at I-17 ^h and Carefree Highway	Several traffic interchange configurations were evaluated, including SPUIs. A final decision on the service traffic interchange type—tight diamond or SPUI—would be made during the design phase (Part 3).
	Recommends a free-flow traffic interchange at Northern Avenue; design volumes used in the analysis need to include Northern Avenue as a high-capacity roadway, and design concepts should be developed and estimated for a free-flow connection to Northern Avenue	The addition of the proposed Northern Parkway connection to SR 303L received considerable attention in this study. Several options to provide a system, or free-flow, traffic interchange were investigated, and the analysis is included in the DCR and this Draft EA (Part 3).

(continued on next page)

Table 5-1. Agency scoping meeting comments (May 2001) (*continued*)

Agency	Comment	Response
City of Glendale (<i>continued</i>)	Recommends a full traffic interchange at Grand Avenue; believes a fully directional interchange is warranted at Grand Avenue and SR 303L	Several alternative traffic interchange designs were evaluated. The recommended design is a three-level service traffic interchange with a SPUI configuration (Part 3).
	Recommends that construction costs for SR 303L as an interim four-lane divided roadway, and ultimately a full freeway, need to be part of any new funding initiative for new freeway construction in the region	As the project evolved, interim construction options were dropped because of the passage of Proposition 400 and the inclusion of SR 303L in the funded MAG <i>Regional Transportation Plan</i>
Litchfield Park	Concerned with secondary impacts to Luke AFB ⁱ and the induced growth caused by providing a freeway facility in the corridor	This issue is discussed in several parts of the Draft EA. In general, Part 2 establishes the traffic demand element; Part 4, Section M, addresses the relationship between SR 303L, land use, and Luke AFB; and Sections Q and R in Part 4 summarize the issues.
City of Goodyear	Goodyear had no comments at the scoping stage other than to confirm it supported the project development process.	No response is needed.
Maricopa County Planning Department	Identified two environmental issues potentially related to the project corridor: land subsidence and military overflights from Luke AFB (and their related noise)	Land subsidence is related to groundwater pumping, and the design team fully investigated subsidence cracks and related issues in developing engineering concepts in the DCR. Noise generated from military overflights would be considered as part of the noise analysis conducted for the proposed project.

^a environmental assessment^b Maricopa County Department of Transportation^c Arizona Department of Transportation^d Federal Highway Administration^e design concept report^f State Route 303 Loop^g single-point urban interchanges^h Interstate 17ⁱ air force base

2. Public Scoping Meeting

Three public meetings were conducted for this project. Public meeting notices and meeting minutes are located in Appendix H, *Public Meeting Information*. The public scoping meeting for the project was held on June 19, 2001, at Dysart High School in El Mirage. This meeting served to inform stakeholders and residents of the proposed study's purpose and goals and the project schedule. The meeting also served to compile comments regarding the proposed work and conceptual alternatives to ensure that the needs and issues important to the public were considered. The meeting was conducted in an open house format and included a brief presentation and a question-and-answer session. Approximately 212 people attended this meeting.

To announce the meeting, advertisements were placed in the *Surprise Independent*, *Daily-News Sun*, and *West Valley View* newspapers. Letters announcing the meeting were sent to agencies, utilities, local officials, and residences located adjacent to the project corridor. The opportunity for persons with disabilities to request accommodations or the notices in alternative formats was provided. A comment form was available for attendees to fill out at the meeting or at a later time. Numerous comments were received and are summarized in Table 5-2, on page 196.

Table 5-2. Public scoping meeting comments and questions (June 2001)

Issue	Comment/Question	Response
CANAMEX Corridor route	Concern that SR 303L ^a would ultimately be used by trucks traveling between Mexico and Canada as part of the CANAMEX Corridor route	This issue is discussed in some detail in Part 3. In general, SR 303L and CANAMEX are separate corridors, many miles apart. However, a high percentage of truck traffic uses SR 303L today and would continue to use the route regardless of improvements to the CANAMEX route west of the White Tank Mountains.
	Concern that even though Vulture Mine Road was ultimately selected as the CANAMEX Corridor route, SR 303L could be the de facto route	See previous item.
Drainage	How will stormwater flow be handled?	The project is being developed in conjunction with FCDMC's ^b Loop 303 Area Drainage Master Plan. A combination of retention basins and drainage channels would be provided to handle stormwater flows (Parts 2 and 3).
	What are the options for drainage within the Study Area?	See previous item.
Facility type	Many expressed a preference for a parkway rather than a freeway.	This issue is addressed in Part 3. In general, the term "parkway" has multiple meanings, and the concept envisioned by the comments does not fit the landscape or level of transportation service needs in the corridor (Part 3).
Noise	Concern was expressed regarding increased noise along the roadway in residential areas.	The conversion to a full freeway-type facility would increase noise levels in adjacent neighborhoods (Part 4, Section H).
	What methods for noise abatement would be applied?	The noise analysis identified a number of potential mitigation measures. The most commonly applied measures are noise barriers and noise barrier-earthen berm combinations. Rubberized asphalt would be used for SR 303L. The ultimate recommendations for the location and type of noise abatement would occur during the final design phase (Part 4, Section H).
Residential impacts	General concern was expressed for residents bordering the project corridor in terms of noise, air quality, and property values.	All of these issues are addressed in this Draft EA. In general, noise impacts can be mitigated within the ADOT and FHWA criteria (Part 4, Section H), and air quality exceedances would not occur with the proposed project (Part 4, Section G). Property values are variable, with some likely to experience lower values and some higher values as a result of the proposed project (Part 4, Section M).

^a State Route 303 Loop ^b Flood Control District of Maricopa County

B. Public Information Meetings

1. November 2001 Public Meeting

A public meeting was held on November 6, 2001, at Dysart Elementary School in El Mirage. This meeting was held to allow interested parties to review and comment on the “interim” and “ultimate” roadway improvement concepts and preliminary environmental findings. The meeting also served to identify any additional project issues and concerns. This meeting was held in an open house format. Approximately 281 people attended this open house and were provided with comment sheets to document comments and concerns they had regarding the project.

In general, comments received at this open house were similar to comments received at the first public meeting, including concern regarding the CANAMEX Corridor route, air quality, and noise impacts. Attendees expressed more interest in the northern segment of the proposed project (north of Bell Road) than the southern segment of the SR 303L corridor.

2. May 2004 Public Meetings

Public meetings were held on May 17, 2004, at Millennium High School in Goodyear (attended by 31 people), and on May 19, 2004, at Willow Canyon High School in Surprise (attended by 124 people). These meetings were held to address updates to the project design alternatives. In particular, details regarding the traffic interchanges with US 60 and I-10 were presented. Both meetings consisted of an open house and brief presentation.

Most comments were consistent with the previous public meetings, focusing on concerns about noise abatement, air quality, CANAMEX traffic, and drainage solutions. A few new questions and comments surfaced, based in part on the (then) pending Proposition 400 vote to be held in November 2004 (Proposition 400 subsequently passed) and the recent completion of SR 303L north of US 60 to Happy Valley Road. This meeting was also the first meeting when a significant portion of the attendees began expressing support for the project in recognition of the area’s travel needs. The new questions or comments are summarized in Table 5-3, on page 198.

Table 5-3. New public comments (May 2004 meetings)

Issue	Comment/Question	Response
Schedule	If Proposition 400 passes, when would work begin on SR 303L ^a ?	At that time, a preliminary time frame of 2011–2016 was drafted by MAG ^b . Subsequently, that time frame ended up being the final recommendation of MAG to the voters, and Proposition 400 passed.
Facility design	The concept of designing the connector ramps at the US 60 ^c /SR 303L traffic interchange to pass under the railroad was supported, with some noting the expected benefits of reduced noise and visual impacts.	Reductions in noise and visual impacts were factors used to select this alternative.

^a State Route 303 Loop ^b Maricopa Association of Governments ^c United States Route 60

C. Public Hearings

Agencies and the public are invited to review and comment on this Draft EA for a period of 30 days. The Draft EA is available for review at:

- Buckeye Public Library, 310 N. 6th Street, Buckeye, Arizona
- City of Goodyear – City Hall, 190 N. Litchfield Road, Goodyear, Arizona
- City of El Mirage – City Hall, 12145 NW Grand Avenue, El Mirage, Arizona
- City of Glendale – City Hall, 5850 W. Glendale Avenue, Glendale, Arizona
- Litchfield Park Library, 101 W. Wigwam Boulevard, Litchfield Park, Arizona
- Luke Air Force Base, Community Initiatives Team, 56FW/CVE, 14185 W. Falcon Street, Luke AFB, Arizona (authorized air force base personnel only)
- Northwest Regional Library, 16089 N. Bullard Avenue, Surprise, Arizona
- R. H. Johnson Library, 13801 W. Meeker Boulevard, Sun City West, Arizona
- Sun City Grand Community Association, 19726 N. Remington Drive, Surprise, Arizona
- City of Surprise – City Hall, 12425 W. Bell Road, Surprise, Arizona
- Verrado Assembly Center, 21209 W. Main Street, Buckeye, Arizona
- Vistancia Homeowners Association, 29701 N. Sunrise Point, Peoria, Arizona
- Willow Canyon High School – Administration Office, 17901 W. Lundberg Street, Surprise, Arizona

Members of the public may also review the Draft EA at the ADOT Web site:

- <http://www.adotenvironmental.com>

During this comment period, public hearings will be held to allow for further project review and comment. Two hearings have been scheduled:

- Tuesday, October 21, 2008
Millennium High School
Cafeteria
14802 W. Wigwam Boulevard
Goodyear, Arizona
6–8 p.m.
Presentation at 6:30 p.m.
- Wednesday, October 22, 2008
Willow Canyon High School
Cafeteria
17901 W. Lundberg Street
Surprise, Arizona
5:30–8 p.m.
Presentation at 6:30 p.m.

Comments will be accepted at the hearings, and they may be mailed to:

- Brock Barnhart
ADOT Northwest Community Outreach Team
1146 N. Mesa Drive, #102-298
Mesa, AZ 85201

Written comments must be received no later than November 7, 2008. For additional technical information, contact Steve Beasley, ADOT Project Manager, at (602) 712-7645.

A summary of agency and public comments received during the comment period, as well as ADOT's responses, will be provided in the Final EA.

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Part 7. Glossary

1,3-butadiene: A colorless gas with a mild, gasoline-like odor. Major sources of airborne 1,3-butadiene include combustion byproducts from motor vehicle engines, manufacturing, and other processes; forest fires; and cigarette smoking. Exposure to 1,3-butadiene causes irritation of the eyes, nasal passages, throat, and lungs in low concentrations and blurred vision, fatigue, headache, and vertigo in higher concentrations. 1,3-butadiene has recently been reclassified from a probable human carcinogen to a known human carcinogen.

100-year floodplain: Areas that are subject to a 1 percent or greater chance of flooding in any given year.

500-year floodplain: Areas that are subject to a 0.2 percent or greater chance of flooding in any given year.

A-weighted decibel (dBA): Sound levels are measured on three weighted scales: A, B, and C. The A scale most closely represents the range of human hearing; therefore, measurements of roadway noise use the A-weighted decibel. The approximate threshold of hearing is 0 dBA, while the approximate threshold of pain is 140 dBA. Most suburban areas have daytime noise levels ranging from 50 to 70 dBA.

access-controlled freeway: A freeway that passes under or over cross streets, allowing for uninterrupted traffic flow.

acetaldehyde: A colorless liquid that is flammable and mixes readily with water. In dilute concentrations, acetaldehyde has a fruity and pleasant odor, which turns pungent at higher concentrations. Acetaldehyde is formed as a product of coffee roasting, tobacco burning, coal refining, waste processing, and of incomplete combustion in fireplaces and motor vehicle engines. It is also formed in the body from the breakdown of ethanol contained in alcoholic beverages. Acetaldehyde causes irritation to the eyes, skin, and respiratory tract and is a probable human carcinogen.

acrolein: A nearly clear to yellow liquid that burns easily, is easily volatilized, and has a disagreeable odor. Acrolein can be formed from the breakdown of certain pollutants found in outdoor air or from burning tobacco or gasoline. Exposure to acrolein causes upper respiratory tract irritation and congestion in low concentrations and may cause death in high concentrations. Not enough information is available on acrolein to evaluate its carcinogenicity.

Arizona Department of Transportation (ADOT): The state agency responsible for providing and maintaining state roads, highways, and other transportation modes.

arterial street: A street that provides a high degree of mobility through an urban area, as opposed to collector and local streets, which emphasize access to adjacent land uses.

at-grade freeway: A freeway that is level with the immediate surrounding terrain.

auxiliary lane: A lane on a freeway that begins at an on-ramp and ends at the next off-ramp, without passing through any traffic interchanges in between. It helps motorists merge onto or exit the freeway.

benzene: A volatile, colorless, highly flammable liquid that dissolves easily in water and has a sweet odor. Benzene is found in emissions from motor vehicle engines, in combustion products from burning coal and oil, and in the gases resulting from evaporation of gasoline and industrial solvents. Tobacco smoke contains benzene and accounts for nearly half the national exposure to benzene. Benzene exposure causes drowsiness, dizziness, headaches, unconsciousness, vomiting, convulsions, and irritation to the eyes, skin, and upper respiratory tract. Benzene is a known human carcinogen. Chronic exposure to benzene causes blood disorders and chromosomal aberrations.

CAL3QHC: The CAL3QHC (Version 2.0) line source dispersion model is an air quality model developed for the U.S. Environmental Protection Agency's Office of Air Quality Planning and Standards to calculate total emissions from moving and idling vehicles and predict the dispersion and estimated concentrations of inert pollutants, primarily carbon monoxide, near highways and arterial street intersections.

CANAMEX: The CANAMEX Trade Corridor is a priority route traversing Arizona, Nevada, Utah, Idaho, and Montana, linking to the Canadian province of Alberta and to the Mexican states of Sonora, Sinaloa, Nayarit, and Jalisco. In central Arizona, the Corridor is to follow I-10 from Tucson to I-8 near Casa Grande, I-8 west to SR 85 near Gila Bend, SR 85 north to I-10 near Buckeye, I-10 west to Wickenburg Road, Wickenburg Road to Vulture Mine Road west of Wickenburg, and then connect with the US 93/US 60 Wickenburg Bypass.

carbon monoxide (CO): A colorless, odorless gas resulting from the incomplete combustion of carbon-based fuels, including petroleum products. In most areas, vehicle emissions are the primary source of carbon monoxide.

census tract: A small statistical subdivision of a county that is designed to be relatively permanent. The U.S. Census Bureau goal is for census tracts, when originally designated, to have between 2,500 and 8,000 people and to be relatively homogeneous with respect to population characteristics, economic status, and living conditions. Census tracts never cross county boundaries.

Criterion A: Cultural resources may qualify for listing in the National Register of Historic Places under this criterion if they are associated with events that have made a significant contribution to the broad patterns of our history.

Criterion B: Cultural resources may qualify for listing in the National Register of Historic Places under this criterion if they are associated with the lives of persons significant in our past.

Criterion C: Cultural resources may qualify for listing in the National Register of Historic Places under this criterion if they embody the distinctive characteristics of a type, period, or method of

construction; or represent the work of a master; or possess high artistic values; or represent a significant and distinguishable entity whose components may lack individual distinction.

Criterion D: Cultural resources may qualify for listing in the National Register of Historic Places under this criterion if they have yielded, or may be likely to yield, information important in prehistory or history. Unless preservation in place is warranted, Criterion D cultural resources sites generally do not qualify for protection under Section 4(f) of the federal Department of Transportation Act of 1966, as amended.

cumulative impact: The impact on the environment that results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

design year: The future year used to determine the probable traffic volume for which a roadway or freeway is designed.

diesel particulate matter: A collection of various-sized particles emitted from diesel powered vehicles, including primarily elemental carbon, organic carbon, and sulfate particles, with trace amounts of nitrate, metals, and other particles. Diesel particulate matter of concern for MSAT analyses are those particles sized 10 microns or smaller. Although particulate matter may be derived from a number of sources, diesel particulate matter by definition is derived exclusively from diesel vehicle exhaust. Exposure to diesel particulate matter results in irritation to the eyes, nose, throat, and lungs, and may exacerbate asthma. Diesel particulate matter is considered a probable human carcinogen.

environmental assessment (EA): A federally mandated report that includes brief discussions of a project need, alternatives, environmental impacts associated with alternatives, and a listing of individuals and agencies consulted. An EA is conducted to decide whether to prepare a finding of no significant impact (FONSI) or to undertake the preparation of an environmental impact statement.

Federal Highway Administration (FHWA): A branch of the U.S. Department of Transportation responsible for administering the Federal-Aid Program, among other programs. The program provides financial resources and technical assistance for constructing, preserving, and improving the National Highway System, along with other urban and rural roads.

fine particulate matter (PM_{2.5}): Composed of suspended dust, fibers, combustion ash, and other fine particles, this pollutant measures 2.5 microns or less in diameter and penetrates the respiratory system to a greater extent than particulate matter (PM₁₀). It contributes to haze in urban areas.

floodplain: A lowland and relatively flat area that adjoins inland and coastal waters and is covered with water during floods.

formaldehyde: A colorless gas with a pungent, suffocating odor that is readily soluble in water.

High levels of formaldehyde have been detected in indoor air, where it is released from various consumer products such as building materials and home furnishings. Major sources of outdoor concentrations of formaldehyde include emissions from power plants, manufacturing facilities, incinerators, and motor vehicle engines. Exposure to formaldehyde results in irritation to the eyes, nose, and throat; coughing; chest pains; and bronchitis. Formaldehyde is classified as a probable human carcinogen.

lead: In its airborne form, this pollutant results primarily from the burning of leaded fuels. Lead pollution has been drastically reduced in the United States in recent years with the ban on leaded automobile fuels.

level of service (LOS): The operating performance of a freeway segment or intersection. Level of service is a qualitative description of operation based on the degree of delay and maneuverability, ranging from LOS A (best traffic conditions) to LOS F (worst traffic conditions).

mobile source air toxics (MSATs): Air pollutants emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

noise barrier: A solid wall or earthen berm that breaks the line-of-sight between the roadway and noise receiver location, reducing the noise level at the receiver.

nitrogen dioxide (NO₂): A yellowish-orange to reddish-brown gas resulting from high-temperature combustion. Diesel vehicles and power plants are major sources of this pollutant.

ozone (O₃): A highly reactive pollutant produced through a complex chemical reaction in which precursor compounds, such as hydrocarbons and nitrogen oxides, are transformed by sunlight into ozone molecules, which consist of three oxygen atoms. The primary sources for ozone precursors are vehicular and industrial emissions.

particulate matter (PM₁₀): This pollutant, measuring 10 microns or less in diameter, consists of suspended dust, fibers, combustion ash, and other fine particles. The major source is industrial emissions, but PM₁₀ also results from diesel vehicle emissions, travel on unpaved roadways, and agricultural and construction activities.

prior rights: The term “prior rights,” as used in this document, refers to a situation involving a utility company that has facilities located on private easements later encompassed by the State’s right-of-way. In this situation, the utility is given a choice of relocating its facilities onto a public right-of-way or of acquiring a new private easement and relocating onto it.

rubberized asphalt: This material consists of regular asphalt paving mixed with ground-up, used tires. Rubberized asphalt is generally smoother, helping to reduce tire noise.

Section 4(f): A section of the Department of Transportation Act of 1966, as amended. The section stipulates that the Secretary of Transportation cannot approve the use of land from a significant publicly owned public park, recreation area, wildlife or waterfowl refuge, or significant cultural resource unless there is no prudent and feasible alternative to the use of that land and unless the action includes all possible planning to minimize harm to the property resulting from its use.

secondary impact: A change that is caused by an action and is later in time or farther removed in distance, but is still reasonably foreseeable. Secondary impacts may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air, water, and other natural systems, including ecosystems.

service traffic interchange: A traffic interchange connecting a freeway facility and a cross street—it typically features traffic signals to regulate traffic flow.

shoo-fly: A temporary stretch of railroad track that detours trains around construction zones.

sulfur dioxide (SO₂): A colorless gas with a rotten egg odor that results from the combustion of fuels containing sulfur. Primary sources are coal-fired power plants, industrial plants, and metal smelters, with some emissions from diesel vehicles using low-grade fuels.

system traffic interchange: A traffic interchange connecting two or more freeway facilities and allowing for uninterrupted traffic flow as motorists move from one facility to another.

tailwater: Excess surface water that drains from agricultural fields.

